BRITISH MEDICAL JOURNAL

LONDON SATURDAY SEPTEMBER 10 1960

HISTORY AND DEVELOPMENT OF TEACHING HOSPITALS IN ENGLAND*

BY

Sir ARTHUR THOMSON, *M.C.*, M.D., LL.D., F.R.C.P.

Teaching hospitals are at a critical stage of development and it may interest boards of governors, when approaching the problems before them, to be reminded of the course of their evolution. In the Middle Ages there were two types of hospital in England: monastic institutions for the care of the sick, and lazar-houses which were important and numerous when leprosy was rife in Europe. Leprosy declined in the fifteenth century and a great number of the lazar-houses fell into decay and disappeared. The dissolution of the monasteries between 1530 and 1540 put an end to the remaining hospitals in England except in a few places where courageous petition to that irritable and despotic monarch Henry VIII ensured the survival of some ancient foundations. It is to petitions of this kind that St. Bartholomew's and St. Thomas's owe their unbroken history.

A Changing Pattern

For two hundred years after the Reformation England was virtually without hospitals of any kind, and a cynic might say that we managed pretty well nevertheless. We defeated the Armada; the Elizabethans wrote their poetry and Newton his *Principia*; the Tudor despotism and the Stuart kingship were changed for the dominance of an oligarchy; Marlborough fought his campaigns; and the sick suffered in silence and apart. England then was a rural and semi-feudal country; the sick poor were scattered in villages, and it was not until towards the end of the eighteenth century that the pattern was completely and quickly changed by the Industrial Revolution. The application of steam-power to the machinery of production, the rise of capitalism, and the enclosure of common lands drove the smaller yeoman farmers and the cottagers from the countryside to the mines and factories of the new industrial centres.

Sickness widely spread in an agricultural community with village workshops might escape notice, but the misery of the sick poor congregated in makeshift towns without sanitation was intensified and compelled attention. Not only was their suffering more apparent but the constant threat of epidemic disease stimulated interest in their condition. It is not surprising, therefore, that the eighteenth century witnessed the foundation of a large number of charitable institutions in the shape of voluntary hospitals. Another factor in this development which has not received the attention it deserves was the change in the climate of English opinion as a result of the evangelical revival. English puritanism before the Wesleys was much influenced by Calvin's belief that salvation came from grace rather than from works of charity in the relief of suffering, but in the eighteenth century there was a profound change, and henceforth to the English puritan charity became an obligation.

The letter which led to the foundation of the Royal Infirmary in Sheffield in 1789 is characteristic of many at the time. "Of all the virtues which form our national character," it runs, "that of mercy and compassion may be justly esteemed the highest ornament." Candour compels me to add, regretfully, that Dr. John Ash, in 1765 in Birmingham, did not take as high a line as your Dr. William Younge, for all he said in his original advertisement was, "A general hospital for the relief of the sick and lame situated near the town of Birmingham is presumed would be greatly beneficial to the populous country about it as well as that place."

Influence of the Voluntary Hospitals

It is not my purpose to trace the course of English voluntary hospitals during the period that followed their foundation until they were taken over by the National Health Service, but rather to examine the way some of them became teaching hospitals and so influenced the progress of medicine in this country. Dependent on voluntary contributions, they were always poor and often in grave financial difficulty; it is remarkable that they were able to provide as good a service as they did.

At the time of the foundation of the hospitals medical education was largely based on a system of apprenticeship. The apothecaries, who then did much of the family practice in the country, were required to serve for five years as indentured pupils to learn the "trade, art, mystery and business of surgeon apothecary and man midwife"; surgeons were trained as apprentices and also as surgeon's "mates" in the Army; physicians, too, frequently had short periods of apprenticeship, but to them it was of much less importance than to the other branches. The would-be physician had first to graduate in arts and become proficient enough in classical scholarship to read Galen and write a commentary in Latin as a thesis for his medical degree.

It is true that the regulations of the ancient universities called for something more than this. In one a candidate was required to attend the lectures of the regius professor of medicine during three terms, to witness two dissections of the human body, and to "keep an act"—that is, to make a dissertation before his teachers and defend it. But early in the nineteenth century official inquiry established the interesting fact that, though many doctorates of medicine had been conferred on members of this university, no regius professor had lectured for more than a hundred years.

*An address to the Annual General Meeting of the United Sheffield Hospitals.

So agreeable an anomaly, of course, would be unusual in any institution lacking venerable tradition, and its existence proves that university regulations at that time were not accorded the respect we hope they have to-day.

In addition to the men trained in this haphazard way there was a vast army of quacks who had no instruction of any kind and who certainly never endured any examination before they embarked on their careers.

An immediate consequence of the foundation of the new hospitals was the extension of the system of apprenticeship to their wards. The privilege of taking apprentices was a valuable perquisite for the members of the hospital staffs. Not only could they exact substantial fees from their pupils but they also obtained free service at negligible cost.

In that way teaching hospitals began. There is no doubt that clinical instruction in the wards was an improvement in education — perfunctory though the teaching might sometimes be. Dr. Wilks said severely that "walking the hospitals" often amounted to little more than looking at the patients and hearing the remarks of the medical attendant. Casual comment of that kind, however, has its value.

Private Schools of Anatomy

Hospital teaching was handicapped by the absence of any provision for instruction in anatomy, and to meet this need private schools, run for profit, were established. Some of these were very famous; in London, for example, the Windmill Street school of William and John Hunter, Skeys in Aldersgate Street, and Edward Grainger's over a tailor's shop in Webb Street at the back of Guy's Hospital. The last was taken over by St. Thomas's in 1842. The high reputation of these schools is witnessed by the opinion of the Registrar of the Royal College of Physicians in 1811 that there was "no need for medical schools as the metropolis abounded with noble hospitals and that medical education was better promoted by numerous private schools as at present arranged than it would be by any national establishment." In the provinces many schools were founded in the pattern of those in London, and in large cities there were often two or three in bitter competition. In Sheffield you had two: Mr. Overend's school, which began in 1828 and failed soon after; and the Medical Institution, which opened the following year and survived to become the Sheffield School of Medicine. The pupils in these private establishments were not confined to hospital apprentices.

A Popular Development

The next step in the evolution of teaching hospitals was the establishment of medical schools within the precincts of the hospitals or closely associated with them. These, too, were often private enterprises promoted by members of the medical staffs. That this development had great advantages and was very popular is shown by the resolution of the Board of Governors of September 8, 1840, which is quoted by J. Langdon Davies in his history of Westminster Hospital: "that it is expedient in conformity to the usage of all the great metropolitan hospitals and most of the provincial hospitals of any magnitude, that this institution should have a school of medicine attached to it . . . but not to involve the Charity in any expense." Westminster seems to have been late in the field, for E. W. Morris records in his history of the London Hospital that as early as 1783 the Governors gave permission for Mr. Blizzard to build a lecture theatre, but there is little reference to the school during the next fifty years apart from comments on the disorders of the pupils. In 1834, however, an inquiry was held which reached the conclusion that there was "no doubt that the school remained in possession of Sir William Blizzard for a long time after its erection and has since passed through various hands without any express permission of the Governors." The final verdict recalls Solomon's judgment on the disputed baby—"that the fabric of the school belongs to the Governors, but the equipment, fixtures, fittings, and contents of the museum belong to the lecturers."

The difficulties that arose at the London were inevitable in a system which enabled lecturers in the medical school not only to keep the profits for themselves but to exclude other members of the hospital staff from teaching in it. Occasionally the lecturers nominated their own successors and sometimes they put their office up for sale.

Troubles among the students were as serious as those of the staffs. In the course of a few years there developed a hierarchy of students. First were the apprentices, who had paid a substantial sum for their indentures and who acknowledged no allegiance to their hospital or to any but their individual masters. These were the student aristocracy, and it was commonly, and often not unjustly, believed that none but those who had paid well for their privilege could hope for promotion in the hospital service. Next came the pupils, who might pay small fees to the hospital for right of entry but more often paid for courses of instruction by lecturers in the medical school. And the lowest form of student life was the dresser, who was frankly a cheap form of labour which he undertook in the wards in return for casual teaching and experience. Strife between these orders must have been frequent. Any of these students might present themselves for approval to one or other of the numerous licensing bodies, who had the power to grant professional titles after examination. Some of these authorities relied on examination fees for their revenue, and in order to attract candidates did not shrink from competitive advertisement of easy examinations and small fees.

From this chaos medical education was rescued by the establishment of the General Medical Council in 1859, and within a few years a minimum curriculum and standard of examination were generally accepted as essential for entry to the *Medical Register*. The effect on the teaching hospitals and private schools was immediate and decisive. Many of the smaller institutions were closed and the surviving medical schools were linked with the larger teaching hospitals under the control of *ad hoc* committees or boards of governors. The new system persisted unchanged in essentials for nearly half a century, and even the establishment of the modern civic universities, which at their foundation often absorbed the existing medical schools and other technical institutions, did not modify it materially for some years, though the appointment of teachers in medicine became the responsibility of universities.

Stimulus to Research

The growth of scientific knowledge, however, and the difficulty of keeping pace with it or extending it experienced by those subject to the pressing claims of

clinical practice for their livelihood, fostered the development of the concept of whole-time academic units in the staffing of teaching hospitals for the promotion of research and clinical science. Distinguished work by Sir Thomas Lewis in the first small unit of this kind to be established in England in 1915 at University College Hospital provided the necessary stimulus, and over the years the present system has steadily evolved, though not entirely without opposition. That the change was wise and happy in its result I am convinced.

Dispassionate survey of the history of medicine in the nineteenth and early part of the twentieth century leaves no doubt that England compared badly with other countries and Germany assumed the undisputed leadership.

Theodor Billroth, Professor of Surgery in Vienna, in the eighteen-seventies examined the reasons for this remarkable German progress "in the course of three decades." His book, *The Medical Sciences in the German Universities,* is tinged by a note of slightly arrogant superiority which an Englishman finds distasteful in any nation but his own. Why, he seems to ask, are we Germans so good? And why, as William H. Welch said in 1924, had German ideas and conditions of medical teaching, study, and research so far outstripped those of other lands? The reason is that in Germany medical education had not been divorced from the influence of universities throughout the nineteenth century as it had been in England. In most English schools of that period the emphasis was on vocational teaching; their aim was the production of the competent practitioner, and in pursuing it they often neglected the cultivation of scientific method and criticism as the basis for progress. The fault did not lie entirely with the English medical schools. Established, as they necessarily were, close to the large hospitals in new industrial towns, there were no universities by which they could be closely influenced. In the whole country there were only four universities; the two ancient and famous ones in Oxford and Cambridge were remote from large hospitals, and in London and Durham they were but slowly taking shape. Billroth in his book mentions over twenty German universities, most of them in populous capital cities of old principalities and in close contact with hospitals, and he draws attention with pride and justice to a long catalogue of their joint achievements. Not least among them was the beginning of the pharmacological revolution inspired by the work of Ehrlich, of which we are now reaping the harvest.

Scotland was more fortunate than England; with a much smaller population, she had four ancient universities, and three of them were in large centres of population. It is not, I think, surprising that the Scottish medical schools were ahead of the English in the nineteenth century, though they did not reach the standard of the German. It is fair to remind you also that the revolution in surgery due to Lister's great discovery of the nature of putrefaction in wounds came from Glasgow and that his inspiration was derived from Pasteur's papers on fermentation, which were put before him by Thomas Anderson, professor of chemistry in Glasgow University. This, surely, is a striking instance of the value of personal contact between the staff of university departments and those who work in the wards of hospitals. It is worth emphasis, too, that the true value of Lister's work was first appreciated in Germany and Scotland.

You must not assume that English medicine was stagnant until recent years. Good, even great, work was done by individuals—in the Guy's School by Bright and Addison, for example—but it was never developed coherently and systematically as it was in Germany and later by the Americans when, under the influence of Abraham Flexner, they adapted German methods in the organization of their medical schools.

Fleming's epoch-making discovery of penicillin would probably have been exploited earlier had there been close contact between his laboratory and a university department equipped to develop it as Florey and Chain subsequently did at Oxford.

Summary

In this outline of the history of English teaching hospitals I have put before you some reasons for my belief that the introduction of whole-time university units to their wards has been a healthy and valuable development. There are others which I have no time to mention, though it would be ungracious not to pay a tribute to the value of the research work that has already come from some of them and to the higher reputation that as a result English medicine now enjoys in world opinion. I can pay that tribute fairly because I was never of the elect and never held a whole-time chair.

The immediate problem before boards of governors is to what extent they should encourage in their hospitals further expansion of the university influence which has already proved its value. There is no simple solution. A great deal turns on the calibre and personality of the men recruited to the staffs of the academic units, on the inspiration they bring to their colleagues and their students; in short, on the schools they found.

There is a real danger in conveying too much power and influence into the hands of individuals; some of the decay of German medicine in the twentieth century was due, in Lord Acton's words, to the corruption that waited inevitably on absolute professorial power. On the other hand, a professor may need support from administrative authority in a difficult field. At the present time I do not think that clinical science is sufficiently developed to supersede all empirical approach and vocational experience in practice—particularly in the field of nosology.

The part-time clinical staffs of teaching hospitals are as essential to the development of academic units as are progressive schools of applied technology to pure science; it is a good thing that any advance in knowledge should be critically examined by those who may subsequently be responsible for its application. Again, a great hospital is the shrine of fine tradition; it has values and an existence of its own, which will be brighter and more effective if tempered by the scientific spirit of the academic units; but I have no wish to see a teaching hospital become a university department of human biology.

That the medical schools and teaching hospitals of England are deeply indebted to their universities for their progress I have freely admitted. The hospitals and schools can best repay that debt by constant demonstration that in their wards and laboratories it is possible to reconcile the claims of exact science with those of humane practice.

HOSPITALS OF THE FUTURE

BY

LORD TAYLOR, M.D., F.R.C.P.

Medical Director, Harlow Industrial Health Service; Member, Harlow Development Corporation

Inevitably and always, most hospitals of the future will be hospitals of the past. It follows that it is more important to know how to improve existing hospitals than build new ones. Improvement is less glamorous than new building; there are seldom foundation-stones to lay and plaques to unveil; and there is less scope for political self-congratulation. Yet in the total scheme of things in Britain, in planning and in spending, new building ought to come a long way behind the job of improving what we already have. Recently I visited a general pathology laboratory in an E.M.S. hut. It had cost £17,000 to make the necessary adaptations and £3,000 to equip. It was a superlative job, perfectly fitted for its work. Had it been tackled as a new block, the regional board would have been lucky to escape with a bill of under £100,000. In thirty years both laboratories will be obsolete. Yet it is usually harder to get money for modest capital reconstruction than for major grandiose new building.

Reconstruction may be cheap, but it is not easy. It requires as much intelligence and thought, planning, and good taste as new building. It often requires even more administrative battling. The greater is the credit due to the hundreds of hospital management committees, doctors, matrons, lay administrators, and works departments who have been quietly working miracles in the past ten years, often out of maintenance budgets. When reconstruction of any department is contemplated the following rules may be helpful:

1. See what others have done by way of reconstruction and new building, especially where the burden of work is similar. Make notes of design, finishes, equipment, and furnishing. Ask about snags and successes in both building and operation.

2. Draw up a *detailed* description on paper of what you think you want. Be prepared to rewrite this three or four times if necessary; your original proposals will certainly be capable of improvement. Such a description must include a detailed projection of the probable burden of work for the next ten years. You will find no one really knows what this is likely to be even in terms of population. Get the help of a statistician if you can. Study your own trends and the trends of others.

3. Remember always that the patient is the centre of the picture. The patients' entrance must be the main entrance, and the patients' waiting and examination rooms must be such as one would wish for one's own family. Keep the patients' rooms small and intimate.

4. Study heating, lighting, and ventilation. Too much of any of these is as bad as too little.

5. Attend carefully to detail. Ugly finishes, decoration, and furniture can ruin the best of designs.

6. Avoid tubular metal furniture. Nothing gives a place a shoddier look more quickly.

7. Remember that the aim is a cheerful, friendly atmosphere for patients and staff. Avoid anything conventionally institutional.

8. Fight patiently and politely until you get what you want. If what you want is right, you will get it in the end. You will certainly tire, but this is only an indication for further effort. The price of success is persistent persistence.

When, however, all this is done, or indeed when nothing is done, achievement in a hospital or a department depends not on buildings but on human beings. Group morale stems from the top, and those in charge have not only to do their job well but to encourage others. Every group has its psychopaths and we have got to make the best of them. Next to technical inefficiency, rudeness to patients is the greatest sin of all. Moreover, it is infectious and can spread downwards. Fortunately the same applies to courtesy and politeness.

New Building

Most of us have never built a hospital; but in the next twenty years many of us will be playing some part in hospital building. So we had better learn our job. My only claims to write on this are: an interest in social medicine, and an experience in helping to build a town.

A hospital is not a "factory" for health as some people think; factories shape inanimate objects. It is much nearer to a school, and nearer still to a "little town." In one sense it is a temporary home for those who are sick, in which all their human needs must be met. In another sense it is an institute for scientific research, for each patient presents a research problem of diagnosis and a practical problem of therapy.

Our town now houses 50,000 people. So far it has cost £36m. This includes homes, factories, shops, public houses, community centres, health centres, roads, water supply, drains, a sewage works, and much else. The capital cost has been about £700 per person, and we are now making a profit. Remember this figure when we come to look at hospital costs.

Before a brick was laid, or even a house designed, in our town a team of experts—not a committee of amateurs—spent two years on research and planning. Engineers and geologists, commercial and traffic experts, statisticians and sociologists, architects and town-planners worked together to draw up a master-plan. Then the amateurs approved it, with little or no modification. So the success or failure of our town was determined before a single house-plan was drawn. I suspect it is just the same with a hospital.

Hospital Costs

Look for a moment at a modern hospital. The University Hospital of Wales is to have 650 beds. It will cost £7m. to build and another £1m. to furnish and equip, or more than £10,000 a bed (Fig. 1). Admittedly this includes a medical school. But £8,000 a bed seems to be a common cost to-day. Is it really right to spend ten times as much on a hospital bed as on a home, workplace, shops, and all the rest for a person out of hospital?

Of course there are many qualifications about these figures. Each hospital bed will be occupied by somewhere between 9 and 18 people in the course of a year. 650 sick people in hospital will need nearly as many well people to look after them. Then there are the out-patient and casualty attendances. But when all this is allowed for, we are paying the bill, and I suspect we are paying too much. Why do things go wrong?

When a hospital is planned to-day everyone concerned wants the optimum maximum, and no one is paying personally. Heaven forbid that the ratepayers should watch costs, as in the old days; the results of that were disastrous. The Ministry of Health is the official watchdog of the public purse, and every capital scheme costing more than £30,000 must be submitted to the Ministry at four different stages. I think this is three times too many and that the one essential step is left out. The Ministry should tell the hospital authorities how much they can spend at the start—and not a penny more should they give. There is nothing like having to build to a price to achieve efficiency, and to control the megalomanic tendencies which we all display when, as architects or doctors, committee members or administrators, we get our hands on other people's money.

Success in hospital building depends on putting our emotions in cold storage. We have to study hospital building as a science.

Science of Hospital Planning

Hospitals are built as a response to human need. Their pattern must reflect the nature of the need they exist to meet. As the need changes so they must change. Parts will grow and other parts atrophy. Since hospitals are human societies, atrophy is painful and apt to be resisted. The object of medical science, taking a very long view, is to do away with hospitals. But so long as human life ends in death they will have work to do.

To-day medical science is working overtime. The chemotherapists, virologists, and the public health services are changing the internal pattern of our hospitals faster than ever before. They have already reduced the need for beds for the acute specific fevers, tuberculosis, poliomyelitis, venereal disease, and general children's diseases. The number of beds occupied by tuberculous patients has fallen in ten years from 26,115 to 14,500—though in the first four years of the last decade the figure went up. In ten years waiting-lists have dropped from 11,000 to just under 400; notifications from 52,000 to 29,000; and deaths from 20,000 to about 4,000.[1] This is a triumph for therapeutic and social medicine, with, however, profound implications for the hospitals.

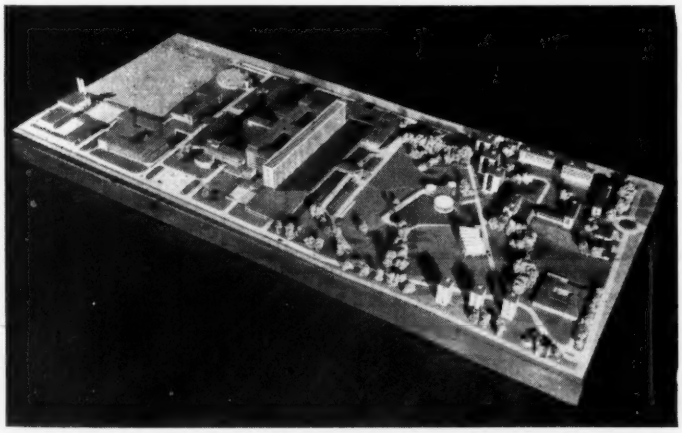


FIG. 1.—The winning design in the competition for the Cardiff Teaching Hospital and Medical Centre. (Architects: S. W. Milburn and Partners.) Note the huge expanse of low building in front of the main block; this will require overhead or artificial light. Note also the deep shadow in the quadrangles behind the main block; contrast this with the free-falling shadows from the tower blocks in the lower right foreground. Crown copyright.

Note the pattern followed: new methods of treatment; an increase in beds to make them generally available; then victory on such a scale that in six years the number of beds needed can be nearly halved. I think we are going to see the same pattern followed in the next ten years in psychiatry. As we get our modern small psychiatric blocks attached to general hospitals, and develop our home psychiatric services, we shall be able to close and bulldoze more than half the old mental hospitals. Dr. T. P. Rees was right when he said they produce more psychoses than they cure.

A new response to human need may mean a long-term increase in the number of hospital beds. Admissions for thoracic surgery are up 130%. But even now such cases occupy under 2,000 beds. It looks as though the decreases will be more spectacular than the increases.

We may conclude thus: because of the speed of advance of scientific medicine, changes in the nature of the work done by hospitals are likely to be more rapid than ever before. Medical success may well produce more redundancy of beds and staff, which is always painful for those concerned. This means that buildings—and specialists—must retain flexibility. The freezing of the present picture in monumental edifices could be disastrous.

At the same time our hospital inheritance is dilapidated and dismal. Upgrading and replacing, even at a lower level of need, will take all we can afford in money, time, and brain-power for the next thirty years. All the more reason why, if we are to put right what is wrong as quickly as we can, we should not overbuild or overprovide. If we could halve the cost of hospital beds without loss of essential quality, we could do twice as much in any one year, and the whole job in half the time. This is the challenge to the hospital planners of the future.

A Hospital Master-plan

Whether it is a case of new building or adaptation, the planning of a hospital ought to begin with a master-plan. This is a book of words and not a drawing. If the master-plan is right, there will be little excuse for the architect to go wrong. The making of a master-plan is a job for experts. It might take from six months to two years to prepare, and cost between £10,000 and £40,000. In the long run it may save ten or twenty times these amounts. The planners must be experts in statistics, social medicine, work-study, and functional planning. They must have access to all the users, and question them and watch them at their work. They must have a chief, a planner-co-ordinator, but they must serve no committee until their work is in final draft form. Sketchy master-plans, prepared by doctors without statistical training, are beginning to be seen nowadays. But these are first steps only, and inevitably they can be very misleading.

This is what the planners will have to do:

1. Define and analyse by age and sex the *population* the hospital is intended to serve, with projections of probable future populations similarly analysed.

2. Analyse the *morbidity* of this population, present and future, and its social setting.

3. Estimate the *facilities needed* to deal with this morbidity in terms of beds and of out-patient, casualty, and other special departments.

4. Study *each department* in detail to find out the work actually done, and the minimum accommodation needed to do this work efficiently.

5. Relate the work of each department in terms of *movement* of patients and staff.

6. Examine the *communications* for patients, relatives, and staff within the area served in relation to ideal and possible locations.

At the end there will emerge a word-picture of the future hospital that will have real meaning, ready for the potential users—doctors, nurses, administrators, and the rest—to criticize, or even approve without criticism. Only when their criticisms have been examined by the planners, and incorporated where appropriate, is the project approaching readiness for the architect to look at and start his sketch plans. He will have before him a task within his capacity, where his own specialist skills can properly come into play.

Some of the parts of the "Master-Plan" will now be looked at in greater detail.

Population to be Served

The population to be served is easily measured where a community is physically isolated. It is less clear where there is any substantial overlap in catchment areas at the margins. Since there is, and ought to be, freedom of choice for both doctors and patients, movement both ways over any catchment area margin is inevitable and right. One may assume, unless there are special units serving wider areas or other unusual circumstances, that this movement will cancel itself out.

Future population will depend on fertility, the death-rate, and migration in and out. Any competent social scientist can work this out, but his estimate will inevitably be subject to regular revision as circumstances alter away from his lines of prediction.

Age distribution of the population must also be determined and predicted for the future. In places undergoing social and economic decay there is a steady ageing of the population. Young folk migrate away before or after marriage. Fewer children are born. So the population gets an increasing geriatric skew. This will reflect itself not only in conventional geriatric needs but also in needs for extra beds for old people in general medical, general surgical, and traumatic and orthopaedic wards, and fewer beds for children and young adults and for midwifery.

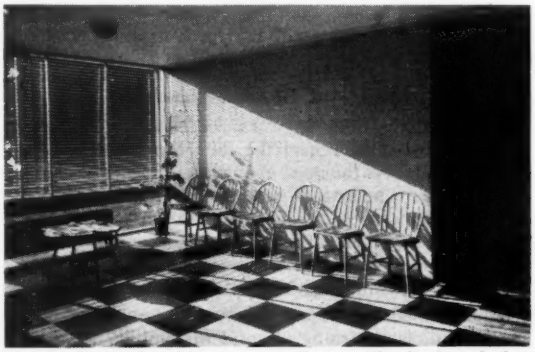


FIG. 3.—Patients' waiting-space at Corby. Simple, homely but attractive furnishings and furniture. (Photographers: de Burgh Galwey.)

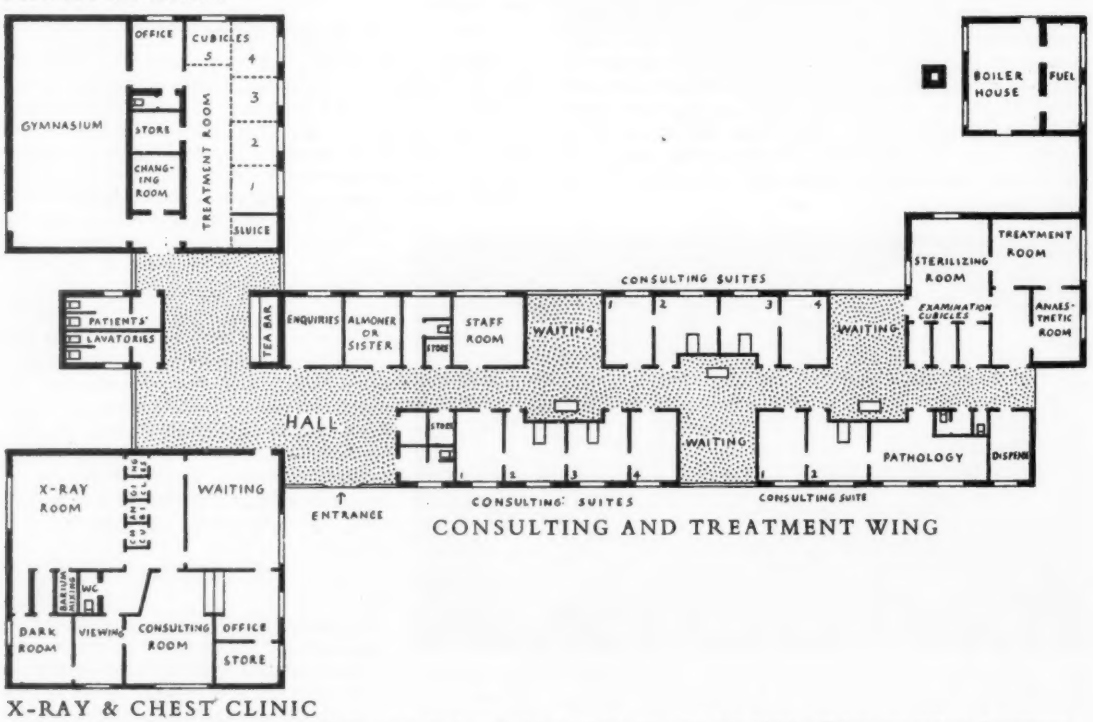


FIG. 2.—Plan of the Nuffield Diagnostic Centre at Corby. A simple and inexpensive but highly efficient out-patient department. (Architect: Richard Llewelyn Davies, F.R.I.B.A.) Plan by courtesy of the Nuffield Provincial Hospitals Trust.

At the other extreme are the new or developing communities. Here the population skew is towards paediatrics and obstetrics. Thanks to improved nutrition and antibiotics, the needs for beds for sick children have been lessening throughout the country. Once infancy is passed, the needs of a community for hospital beds remain at a comparatively low level, apart from obstetric need, until the fourth decade.

It follows that a new or developing community is likely to need a comparatively smaller number of general beds for some years, but it will not retain this indefinitely. After, say, twenty years it will come to approximate to the general picture for the country as a whole. From then on, unless it absorbs its own children, it will have a greater than average proportion of old people, and a consequent geriatric morbidity skew.

All this can be expressed with mathematical precision, preferably also in diagrammatic form as histograms or population pyramids.

Current thinking suggests that the optimum population for a single general hospital is about 150,000. This figure is arrived at by calculating backwards from the present conception of optimum hospital size of 400–600 beds. This figure has been reached by rather imprecise socio-medical studies of hospitals. Swedish experience suggests that a hospital which is too big becomes socially incoherent and economically inefficient, while it is generally agreed that a hospital which is too small does not allow for the amount of specialization necessary for medical efficiency.

But within these margins much greater precision is needed. If 100 more beds than are actually required are provided, the extra bill will be nearly three-quarters of a million pounds. Moreover, the right figure for different areas will vary widely, depending on morbidity and local social conditions.

FIG. 4.—Consulting suite at Corby. Again, simplicity on a human scale. (Photographers: Peter Pitt.)

Morbidity, Social Setting, and Hospital Need

The importance of differential morbidity was brought home to me when carrying out the Nuffield survey of Good General Practice.[2] The infant mortality in urban areas visited varied from 57 per 1,000 live births at one extreme to 16 per 1,000 live births at the other. Doctors' services per patient at risk per year varied from 7.8 in parts of South Wales to 3.8 in southern England. This variation in morbidity extended not only to the conventional social diseases, such as tuberculosis and rheumatic carditis, but also to many organic conditions, the cause of which is still unknown. An example is the variation in the incidence of pernicious anaemia revealed by the recent survey of the College of General Practitioners.[3] Another striking example, with profound hospital implications, is chronic bronchitis and right-sided cardiac failure.[4] Again, mothers in an area of former economic depression carry with them a legacy of juvenile malnutrition, with the result that obstetric difficulties of all kinds are more common.

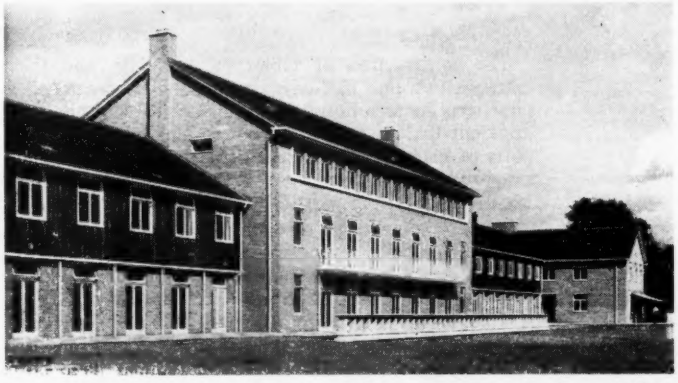


FIG. 5.—Halliwick Hospital for acute psychiatric cases, New Southgate H.M.C. 137 beds; provisional cost £260,000. (Architect: F. A. C. Maunder, F.R.I.B.A.)

The other extra-hospital variable is the degree to which the home care of ill-health and home midwifery are practical and desirable. If housing conditions are

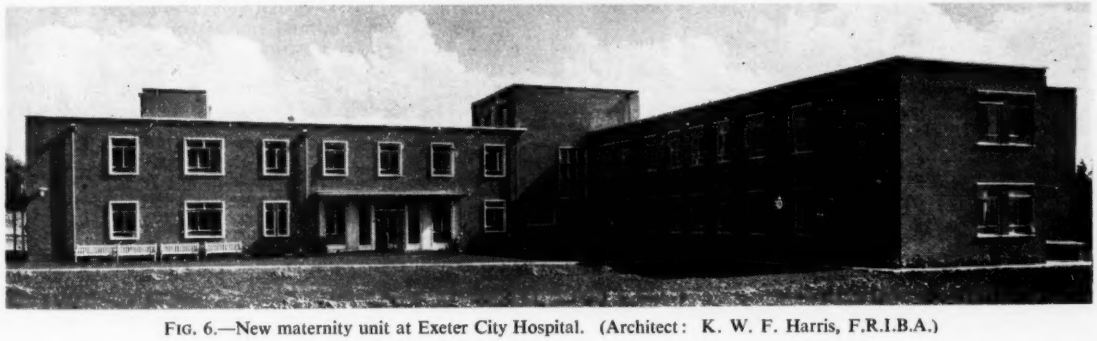


FIG. 6.—New maternity unit at Exeter City Hospital. (Architect: K. W. F. Harris, F.R.I.B.A.)

good, home delivery and the efficient home care of much chronic sickness and psychiatric ill-health are possible and often desirable, provided there are proper home-help and home-nursing services. To provide these is far less expensive to society than to provide institutional beds. There is much evidence to show that most mothers prefer to have most of their babies at home. The Cranbrook Report recommendation of 70% hospital confinements is, in my view, unrelated to reality.

The synthetic build-up of the picture of hospital need may come as a shock to those doctors who are convinced that their departments should be greatly enlarged. It may also show that certain voices in the wilderness on the hospital staff—for example, the orthopaedic surgeons, the gynaecologists, and the psychiatrists—have far greater needs for beds than their general colleagues. Yet even here careful clinical analysis may show a tendency towards over-zealous hospitalization.

Hospital Facilities Needed

The check on the synthetic picture is provided by the examination of the actual use of existing hospital beds and the size of existing waiting-lists. For information about this we are largely indebted to the Nuffield Provincial Hospitals Trust.[5 6 7]

The key figures arrived at so far by the Nuffield Trust investigators are summarized in Table I (further studies are in progress).

TABLE I.—*Number of Beds for Acute Cases Needed Per* 100,000 *Population*

	Northampton	Norwich	Reading	Barrow
General medicine	27·4 } 43	} 43·4	48 } 60	57·3 } 73·8
Paediatrics	13·5		12	11·0
Dermatology	2·1		—	5·5
General surgery	68·9	68·9	56	67·5
Orthopaedics	—	30·5	23	24·4
Gynaecology	21·1	10·7	14	30
Obstetrics	26·9	20·4	30	35·5
E.N.T.	11·7	12·2	10	14·3
Ophthalmology	7·2	5·9	7	9·9
Dental	Incl. in general surgery	Incl. in E.N.T.		0·6
Total	178·8 (excluding orthopaedics)	192·0	200·3	256·0

There are a number of "ifs" and "buts" about this table which are thoroughly explored in the appropriate Nuffield Reports. However, two conclusions can be firmly drawn. First, the estimates made in the early days of the National Health Service of 500-700 beds for acute cases per 100,000 population were at least 100% too high. Secondly, local differences in morbidity and social setting may account for up to a quarter of the total number of beds needed.

A similar type of analysis may be made of out-patient consultations. Table II presents a composite picture, based primarily on the Northampton results, except where these are atypical.

If we assume that there are 300 working days a year, the average daily attendances on the above figures would be 122 patients per day, or 61 per half-day session. This is a smaller case-load than that dealt with in many three-member general practices in a group surgery. An ideal group-practice surgery for three doctors will cost £10,000. Yet a new out-patient department for 61 patients per half-day may cost £200,000. Clearly, the out-patient department must cost more. But unless major facilities for in-patients are also included, such a discrepancy would seem to require explanation.

TABLE II.—*Out-patient Attendances Per* 100,000 *at Risk Per Annum*

	New Cases	Old Cases	Total Attendances
General medicine	875	3,500	4,375
Paediatrics	185	555	740
Dermatology	424	1,272	1,696
General surgery	1,935	3,870	5,805
Gynaecology	605	907	1,512
Obstetrics	680	4,760	5,440
Orthopaedics	1,308	3,620	4,928
Fracture clinic	314	1,570	1,884
Ophthalmology	740	2,960	3,700
Ear, nose, and throat	1,430	2,145	3,575
Dentistry	40	30	70
Psychiatry	185	925	1,110
Physical medicine	300	1,500	1,800
	9,021	27,614	36,635

The construction of tables of this type, and their extrapolation into half-days or other units of work, is a vital step in any hospital plan. It will soon become apparent that, if rooms are not to stand idle for large parts of each week, different departments must use the same rooms on different half-days—as indeed they have usually done in the past.

At a certain point, case-loads and work-units must begin to turn into rooms and work-spaces. All this has been explored in some detail by the Nuffield Provincial Hospitals Trust and the Division for Architectural Studies of the Nuffield Foundation.[5] The principles of the ideal small out-patient department have been given practical expression by the Trust at Corby. The quality is higher, and the cost is perhaps a quarter of that for conventional out-patient buildings (Figs. 2, 3, and 4).

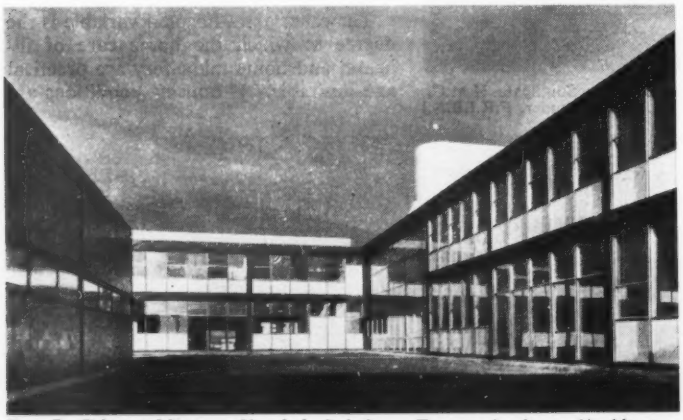


FIG. 7.—Princess Margaret Hospital, Swindon. Too much glass. (Architects: Powell and Moya, F.F.R.I.B.A., in association with R. Llewelyn Davies, F.R.I.B.A., and W. J. Jobson, F.R.I.B.A., regional architect.) Reproduced by permission of the *Architectural Review*.

It is beginning to be realized that it is a mistake to think of hospital beds as a uniform entity. I first grasped this when I learnt it was possible to build an ideal modern psychiatric unit of 137 beds for under £300,000 (Fig. 5). I then found that this also applied to a first-class maternity block. The excellent new maternity block at Exeter cost £3,800 per bed, or £4,500 per bed if the midwives' home was included (Fig. 6). Professor McKeown[8] has found that

only half the patients in hospital need the elaborate and full ward facilities. It is only for these beds that high-priced buildings are justified. Convalescent and psychiatric beds can be largely "self-running," inasmuch as most of the patients can play a substantial part in the routine work of the ward. Psychiatric and some geriatric patients need supervision and training rather than conventional nursing. Again, there is no need for lavish technical equipment for beds for the chronic sick: the nearer the provision can approximate to that of the patient's home the better; the idea may well be a series of small bed-sitting rooms with some open ward-space and a day-room. To provide expensive beds because it is architecturally convenient to have a standard ward design is manifest folly.

I must confess to seeing no future for general-practitioner beds, save in very remote areas. That is not to say that some G.P.s with special experience should not have a proper place in hospital. But if general practice is to mean full specialization in extra-hospital medicine, in the home, the surgery, the clinic, the school, and the factory, there is no time for looking after patients properly in hospital. What the G.P. needs is open access to the pathology, *x*-ray, and physiotherapy departments; a good domiciliary consultant; home-nursing, home-help, and health-visitor service at his disposal; and proper secretarial help. All this is coming fast, though most slowly around the teaching hospitals.

FIG. 8.—Welwyn Garden City and Hatfield Hospital, Hertfordshire. A simple conventional regional board hospital. Not too much glass. Costs: 330 general beds at £5.900 per bed; 100 psychiatric beds at £2,900 per bed. Compare this with the prices for other recent projects. (Architect: F. A. C. Maunder, F.R.I.B.A.) Crown copyright.

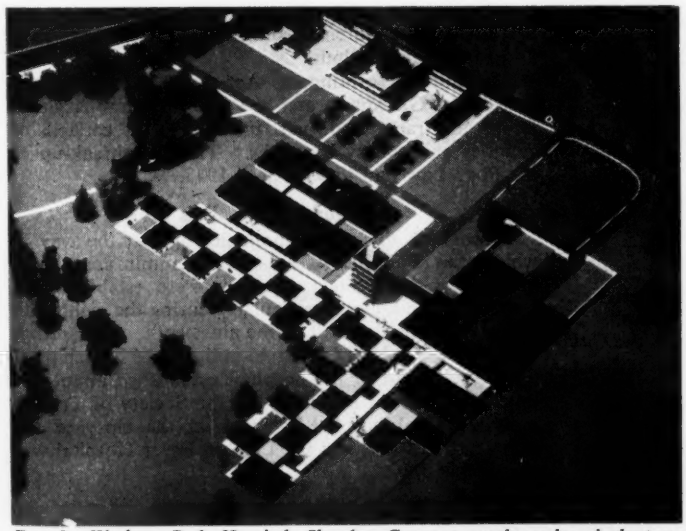


FIG. 9.—Wexham Park Hospital, Slough. Compact quadrangular single-story planning. The current estimated cost of stage 1, which comprises 296 beds for acute cases, including 40 children's beds, is £1,850,000—that is, £6,150 per bed. (Architects: Powell and Moya, F.F.R.I.B.A., in association with R. Llewelyn Davies, F.R.I.B.A., and J. R. Weeks, A.R.I.B.A.)

Briefing the Architect

At a certain point the hospital master-plan (or departmental plan in the case of reconstruction) has to turn into a brief for the architect. Here are some rules which may be of value:

1. *Start with Money.*—Decide how much you can spend. Then reduce by 10% to allow for the increase of costs and extras which will arise during construction. Now deduct from your sum the cost of the site; cost of site works; cost of furnishing and equipment; architects', consulting engineers', and quantity surveyors' fees; and a margin for contingencies. What remains is what you can allow the architect to spend on the building. Remember the architect and his professional colleagues are paid on a percentage basis. So the more the buildings cost the greater are their profits. You can prevent overspending only if you brief the architect absolutely firmly right at the start, and watch him *and yourself* all the way through. If you or he make *any* variations, always ask for a written statement (to which you can hold him) of the extra cost involved. Architects are very *nice people*; you must be correspondingly *tough*.

2. *Efficiency with Economy.*—To obtain efficiency there has to be compromise all along the line, by users as well as by architects.

3. *Keep all rooms as small as possible.*—Specify room sizes whenever you can. The normal human units in medicine are two, three, or four people (including the doctor and patient). Keep your room heights low, domestic rather than institutional. The extra feet below the ceiling waste heat and make small rooms look depressing.

4. *Beware of Too Much Glass* (Figs. 7 and 8).—Ask yourself how every piece of glass can be cleaned from the outside. Forbid glass or curtain walls. Be careful of picture windows which will not open. Architects hold the mistaken belief, arising from the Rollier heliotherapy of the 1930s, that the sun has magical therapeutic properties. They forget that the sick need privacy rather than publicity, though a view from the bed is nice if you can get it. They forget that patients have to undress. They forget the misery of being overheated and over-illuminated on a bright day if one is ill. Their usual answer is the aluminium venetian blind. This filthy object is almost impossible to keep clean and free from dust and germs. It should be forbidden.

5. *Beware of new fancy materials and flat roofs.*—After bitter experience, we have forbidden flat roofs in our new town. Even the best flat roofs expand and contract, so producing leaks at the points where they join the walls. Most architects want to use the latest building novelties, which have not stood the test of time. Refuse firmly to be their experimental animals. Brick and stone are still the two best building materials. What was good enough for Wren is good enough for you.

6. *Pick your tender list of contractors very carefully.*—Better still, negotiate a contract with a good firm of builders. Establish good relations with your site agent and foreman, but never issue an instruction direct to them. This is an "extra" for which you will be charged through the nose. Most builders are honest, good craftsman who want to give you a good job. If architect and builder disagree on a practical point, the builder will often be right.

7. If the site permits, have a tightly designed single-story building, or at the most two stories (Fig. 9). If possible avoid monumental slabs or towers. They enforce rigidity on the unknown needs of the future. On limited town sites tall buildings may be inevitable. See where they cast their shade. Low buildings adjacent may never see the sun. For hostels or staff flats, however, tall buildings have much to commend them. Good quadrangular building is, in my view, the ideal form, giving compactness, beauty, and flexibility on a human scale. Think of Oxford and Cambridge Colleges and do likewise if you can.

8. Put the patient in the centre of the picture first, last, and all the time.

9. Get from the Ministry of Health an overall sum within which you must work. Provided you keep within this sum, and your own master-plan, press forward regardless of man-made obstructions. You may get the sack—or a knighthood. Neither matters, for you will have served the community and the patients properly. That is the object of the exercise.

REFERENCES

1 *Report of the Ministry of Health for 1959*, Cmnd. 1086. H.M.S.O., London.
2 Taylor, S., *Good General Practice*, 1954. Oxford Univ. Press, London.
3 Scott, E., *J. Coll. gen. Practit.*, 1960, **3**, 80.
4 *Brit. med. J.*, 1958, **1**, 884.
5 Davies, R. Llewellyn, *et al.*, *Studies in the Function and Design of Hospitals*, 1955 [Nuffield Provincial Hospitals Trust]. Oxford Univ. Press, London.
6 Barr, A., *Lancet*, 1957, **2**, 1105.
7 Forsyth, G., and Logan, R. F. L., *The Demand for Medical Care*, 1960. Oxford Univ. Press, London.
8 McKeown, T., *Brit. med. J.*, 1959, **1**, Suppl. p. 122.

BRITISH HOSPITALS AS THEY WERE BEFORE 1948

BY

Sir ALLEN DALEY, M.D., LL.D., F.R.C.P.

Though it is only twelve years since the National Health Service was introduced there are many now working in, or associated with, the hospital section of the Service who have little or no personal knowledge of the British hospitals as they were before July, 1948, when they were taken over by the State.

There have been places for the care of the sick from the dawn of civilization, and throughout the ages many men and women with an urge to help suffering mankind have been drawn to serve in them. It was an urge similar to that which drew them into religious communities.

Bishop Basil founded a hospital at Caesarea in A.D. 370 and Archbishop Chrysostom one at Constantinople in A.D. 400. In Britain the first general hospital of which there is record, St. Peter's, York, was founded by the Saxon King Athelstan and the Cathedral Canons; St. John's, York, was started by Lanfranc, Archbishop of Canterbury, in 1084. The oldest British hospital still functioning is St. Bartholomew's, Rochester, which began in 1078 as a leper hospital. It was soon followed by St. Bartholomew's, London, founded in 1123 by Rahere, the monk. After the dissolution of the monasteries, Bart's, along with the other four "Royal Hospitals," was put by King Henry VIII under the care of the City Corporation.

Care of the Sick Under the Poor Law

Soon after this the great Poor Law Statute of Queen Elizabeth I was passed, and the State took over from the Church responsibility for the destitute, including the poor who were ill. The Poor Law was reformed in 1834; "Guardians" replaced the "Overseers" of the poor; larger administrative units were formed by the union of parishes; "sick wards" were established in the "workhouses"; and from about 1867 "separate" infirmaries or Poor Law hospitals were established, particularly in London and the large towns. Liverpool started a training-school for nurses in 1865 at the Brownlow Hill Infirmary of the Select Vestry.

In 1867 the Metropolitan Poor Act was passed and the Metropolitan Asylums Board was formed to take certain classes of the sick-poor out of the workhouses. The Board's service was the first organized hospital system of this country. It provided and administered hospitals for those suffering from fevers, for the mentally defective, for children needing long-stay hospital care, and for the tuberculous.

The Local Government Act, 1929, abolished the Boards of Guardians and the Metropolitan Asylums Board and transferred their functions to the councils of counties and county boroughs. The final break-up of the Poor Law had to wait until 1948.

Voluntary Hospitals

Throughout this period prejudice against the way in which the Poor Law Acts were administered was growing, and voluntary hospitals were established in considerable numbers, particularly during the eighteenth century and the first half of the nineteenth. The springs of benevolence flowed freely to mitigate the hardships of the poor. Most of the hospitals established about this time were general hospitals, but the Society of Friends built a mental hospital in York at the close of the eighteenth century, and the London Fever Hospital was founded in 1802.

Local Authority Hospitals

From about 1866 yet another type of hospital had been developing—namely, that organized by the local councils. It started with isolation or fever hospitals,

but the one at Barry, in South Wales, provided a small general hospital. Then the larger authorities built sanatoria, some provided maternity homes or hospitals, and others provided orthopaedic hospitals for children. Just before 1929 the Bradford Corporation took over from the Board of Guardians, St. Luke's, a large general hospital, and administered it as a part of their health department. Apart from this, the local authorities or joint boards had for many years provided mental hospitals and institutions for the mentally defective.

In 1929 there were therefore three types of hospital: voluntary, Poor Law, and local authority. The 1929 Act brought the latter two under the same administration except for the fever hospitals of the smaller sanitary authorities. The voluntary hospitals were left undisturbed; they had to continue to find their own finances, which they tried to do by setting up contributory schemes whereby for small weekly payments their members escaped paying a charge when admitted to hospital; later, in London and other places this benefit was extended to the municipal hospitals.

The 1929 Act

There is no doubt that the 1929 Act was a great step forward but, following common Parliamentary practice, though it gave abundant *powers* to the authorities which elected to use them it did not *require* an apathetic authority to do anything more than administer the Poor Laws. For example, an authority could make a declaration that it proposed to "appropriate" the Poor Law hospitals and administer them under the Public Health Acts. On the other hand, if an authority made no such declaration the hospitals continued as Poor Law hospitals, admission to which was normally through the relieving officer and was limited to the sick poor—though emergency patients could always be admitted by the medical superintendent. But if the local authority appropriated them, the hospitals were open to receive any sick inhabitant of the district, though, incidentally, he was assessed to pay according to his means, with the proviso that he was not charged more than the average cost of treatment in that hospital. The Act also removed the transferred Poor Law hospitals which had been "appropriated" from the detailed oversight of the Ministry of Health.

The result was as might be expected. The larger and more enlightened authorities—often but not necessarily synonymous — quickly "appropriated" their transferred hospitals, lavished attention and money on them, and were proceeding to build up a first-class hospital service. In the many places, however, where zeal was lacking or where those wedded to the old Poor Law traditions were influential in local circles, the change from the Guardians to the town or county councillors made little alteration. In such areas the voluntary hospitals alone were available for those who did not wish to be admitted to a Poor Law hospital.

A provision of the Act which is worthy of mention is that the voluntary hospitals of a district had to be consulted if a local authority proposed to provide new or enlarged hospital accommodation. This brought into being committees representative of the voluntary hospitals, and provided a forum where all hospital problems could be discussed. The committees so formed in London, Liverpool, and Manchester did work of great value.

Pre-war Years

The years between 1930, when the hospitals were actually transferred, and 1938, when the shadow of another world war began to be felt and all capital expenditure not needed for the war effort had to be curtailed, do not form a long period in hospital history, and it is indeed remarkable how much was achieved in some areas in this short time.

Perhaps I may be permitted to point to the striking example of the London County Council under the able and energetic guidance of Sir Frederick Menzies, though this Council was by no means unique in the progress made. The London County Council was responsible for the administration of 98 hospitals of all types, including the mental hospitals, containing 72,000 beds. Many were already obsolete in 1930, and, though much was done by reconditioning (Figs. 1 and 2), some were

FIG. 1.—A very old ward at Lambeth Hospital before reconditioning.

FIG. 2.—The same ward at Lambeth Hospital after reconditioning.

beyond improvement, and the only real solution was to demolish and rebuild. Heavy capital expenditure was incurred; much more was spent proportionately, when increased building costs are taken into account, than during the decade after 1948 (Fig. 3). The ratio of nurses to patients was substantially raised: The patient–nurse ratio varied greatly in the hospitals which were taken over. In the acute general hospitals it was, on the average, about one nurse to five patients. Their range of salaries also varied, and some ward sisters received as little as £40 a year together with board and lodging. The London County Council built nurses' homes, reduced the hours of work, raised and standardized their salaries, and gradually increased the numbers employed. In 1935 alone the number of ward sisters was increased by 100 and of staff nurses and students by 500 in 12 of the 27 acute general hospitals where the establishment of staff was reviewed at that time. In many hospitals the number of nurses was doubled between 1930 and 1938.

FIG. 3.—North-eastern Fever Hospital (now St. Ann's General Hospital, Tottenham)—a view of a new ward built in 1935.

FIG. 4.—Roof-garden at the Maudsley Hospital.

Outside consultants, often from teaching hospitals, were brought in and were paid for their services—a payment which the voluntary hospitals did not make. Special units were provided and research was encouraged. New operating theatres and pathological laboratories were built and staffed. Out-patient departments were opened, and in some, but by no means all, the general level of medical, surgical, and obstetrical work was first-class.

In the meantime, the voluntary hospitals were also developing to meet expanding medical needs. There were occasional princely donations and legacies, but the distribution of the money available was uneven: the large and well-known teaching hospitals attracted more money than the voluntary non-teaching and cottage hospitals. During this period the King Edward Hospital Fund and the Nuffield Provincial Hospitals Trust came to the rescue of many voluntary hospitals in need of money for capital purposes, and, as mentioned earlier, the contributory schemes helped with routine maintenance costs.

The voluntary hospitals had almost a monopoly of medical teaching, though both in the provinces and in London local authority hospitals were used for teaching on fevers and often on mental diseases. In London most of the 12 undergraduate medical schools were linked with municipal hospitals for some of their teaching, and the County Council itself provided university teaching in mental diseases at its Maudsley Hospital (Fig. 4) and developed its Hammersmith Hospital for the use of the then British Postgraduate Medical School, which is now renamed the Postgraduate Medical School of London.

Effects of War

This, then, was the position just before the outbreak of war. It was realized that bomb casualties would be so

numerous that *all* suitable hospitals must be available to receive them, and that many of the best hospitals were in such vulnerable locations that they could only provide a limited number of beds for emergency treatment. Hospital regions were devised by the Government; and in each a hospital officer was appointed, to be responsible for the distribution of casualties. London and the Home Counties were divided into 12 sectors radiating out from the centre; each sector headquarters had a hospital officer, always from a teaching hospital, and another from the municipal side, together with sector matrons and lay administrative officers.

Hospitals in the vulnerable areas were paid by the Government to keep many of their beds empty but ready to receive casualties when necessary. Additional beds were needed to replace those in the central hospitals which had either been closed or were being kept empty awaiting casualties. Many hospitals outside the most dangerous areas were "up-graded" by the provision, at Government expense, of operating-theatres; and *x*-ray and pathological departments were transferred in. After the outbreak of war a substantial number of emergency hospital annexes were built in the grounds of hospitals, such as sanatoria and mental hospitals, away from the most dangerous areas. Medical and nursing staff were moved from the central hospitals with closed beds to the periphery. Many patients were sent home at the outbreak of war, and, as they included some with infectious tuberculosis, this was alleged to be, and probably was, a factor in the subsequent increase in the incidence of this disease. The male comparative mortality figure for respiratory tuberculosis in 1941 was 1.36 and was the highest since 1932; it has never been exceeded since.

The staffs of voluntary and municipal hospitals were merged, and found themselves working together in the peripheral hospitals. Most of the senior medical staff of teaching hospitals found themselves with their private practices gone, and they were attached at small salaries to up-graded hospitals many miles from their homes. But, after a few months of the "phony" war, private practice began to reappear; many people who had left the cities at the outbreak of war returned and had to be provided with hospital care. To meet this need most local authorities opened up some of their closed beds, as the demands from the civilian sick were growing and the scheme for sending in-patients "down the line" became choked. When serious bombing began in September, 1940, the difficulties were accentuated, and from then until the end of the war there was a constant backward and forward movement of the civilian population between their home towns and the rural areas, depending on the intensity of the bombing. Every L.C.C. hospital within the county and many voluntary and out-County-L.C.C. and other municipal hospitals were hit at some time during the war, and, as some were so badly damaged that they had to be closed for short or long periods, this added to the general shortage of beds (Figs. 5 and 6). Official national policy had been to leave the chronic sick in the hospitals to which they were accustomed and not to send them to peripheral hospitals, and it was not until the middle of 1944, when "buzz bombs" became active, that it was decided to move these patients, including the tuberculous, and numbering

FIG. 5.—The Park Hospital—the result of a bomb.

FIG. 6.—War damage at Lewisham Hospital.

in all over 6,000, from the London area to safer hospitals in other parts of the country. This move was effected in 14 days. It illustrated the good will which had developed among the staffs of all hospitals, but it had an effect on the staffing of hospitals immediately after the war, because their nursing and other staff went with them, and many, having settled down comfortably elsewhere, never returned to their London hospitals.

These wartime arrangements were necessary to cope with a national crisis when the country needed every hospital bed it could get. The scheme proved itself during the war, and those who, towards its end, had begun to think about a universal national hospital service naturally used their war experience in designing the new scheme. The main points which emerged were that a hospital service must be planned on a regional basis and that all hospitals must be linked in some way with the founts of medical progress, the medical schools.

This was the position in 1944, when the Ministry of Health and the Department of Health for Scotland produced their famous White Paper. At the outbreak of war all vested interests had had to be discarded, and every hospital was, in effect, told what it had to do, though the day-to-day control was left with those who had provided the hospital. Towards the end of the war many voluntary hospitals were able to remain open only because the Ministry of Health paid their deficits. Large expenditures were needed to repair war damage and to overtake arrears of maintenance which had accumulated during the war.

The 1946 Act

There was much discussion between the Ministry of Health, the British Hospitals' Association, and the local authorities while the 1946 Act was being drafted. Agreement was almost reached on the future structure while Mr. (now Sir Harry) Willink was Minister of Health. The basis was that hospitals would remain under their then management but would receive heavy Government subsidies, which would be allocated to individual hospitals by regional committees containing representatives of both voluntary and municipal hospitals. After the General Election of 1945, Mr. Willink was replaced by Mr. Bevan, and the decision was taken to nationalize all the hospitals, as was done in the 1946 Act. As soon as this decision became known there was clearly no incentive for either voluntary or municipal hospitals to embark on large-scale modernizations, and, even if they had so wished, national restrictions on the use of building materials and labour, needed in priority for house and factories for the export trade, precluded them. The Ministry therefore came into possession in 1948 of a large number of hospitals, many of which were worn out but which would have been even worse but for the Trojan work of some local authorities who, between 1930 and 1938, lavished large sums of money on trying to improve their own, to some extent squalid, inheritance from the Poor Law authorities.

Bed Strength

The number of beds in England and Wales in 1944 in some 900 voluntary hospitals was about 77,000, but, though they included 25 large teaching hospitals, there were over 250 hospitals, mainly cottage hospitals, with fewer than 30 beds each. On the other hand, the municipal hospitals contained over 370,000 beds: they included 70,000 in 140 "appropriated" general hospitals and another 60,000 in 400 hospitals and institutions still administered under the Poor Law Acts. The White Paper says of them: "This great pool of 130,000 beds represents a varied service at every stage of development from the sick wards of an institution for the aged or chronic sick to the most modern and up-to-date of hospitals with every kind of special department and equipment and highly skilled staff." There were also 38,000 beds in 810 isolation hospitals, 28,000 in sanatoria, mostly municipal, and about 175,000 in hospitals for the mentally sick or defective.

It will be seen from the above that on the "Appointed Day" in July, 1948, when hospitals were nationalized, the voluntary hospitals were numerous but most of them were small. They contributed about 77,000 beds compared with over 370,000 in the municipal hospitals taken over by the State. The voluntary hospitals did not pay their senior medical staff, but they got the best, as it was regarded as a professional distinction to obtain a post as an "Honorary." The voluntary hospitals could choose which patients they would admit, and concentrated on acute work. There were often squabbles between them and the municipal hospitals—which had statutory obligations to admit the sick poor—when a voluntary hospital asked a municipal one to take over a patient of whom the voluntary hospital wished to be rid. The fever hospitals, except in the large towns, were generally small, and, with the reduction in the incidence of the acute infectious diseases, were finding it difficult to justify their existence, except by amalgamating with their neighbours or admitting patients with types of illness other than those for which they were originally built.

The mental hospitals and the institutions for the mentally defective had always been outside the stream of the general hospital world, and, except in Glasgow, Surrey, and London, they had been in a separate department from that responsible for the other local authority hospitals. It is all to the good that they are now an integral part of the national hospital scheme, though their traditions, size, and geographical isolation make real assimilation difficult.

Independent Hospitals

I have dealt with the hospitals incorporated in 1948 in the National Health Service. There are, however, some hospitals which declined to enter the new scheme and remained "independent." They include hospitals established by religious bodies; an orthopaedic hospital originally built by the Trade Unions; The Royal Masonic Hospital; St. Andrew's Hospital, Dollis Hill; the French and the Italian Hospitals; a number of convalescent homes and mental hospitals, and a few private hospitals and nursing-homes run as commercial enterprises. Few would wish to force them into the State service, and most will hope that they may long continue. As in the case of private, curiously called public, boarding schools, their future will depend on their charges and on the value which the public puts upon their services.

Before and After

It only remains to point out the main differences between the pre-1948 hospitals and those of to-day. The medical and nursing staffing has been greatly strengthened. All medical staff are now paid for their services. The pay is fixed on a uniform national basis: before 1948, hospitals in unattractive districts could, and

did, pay their junior medical staff more than did those which were more attractive from a professional or geographical point of view.

There was little out-patient work in the former municipal hospitals. Hospital building has been sadly neglected, though in recent years the Government has placed considerably more money for capital development at the disposal of its agents, the various hospital boards. Out-patient work is increasing everywhere. The type of administration has tended to follow that of the former voluntary hospitals—that is, overall administrative control is passing from medical into lay hands. Before 1948 each municipal hospital had a prescribed district and a statutory duty to admit patients from their district in need of in-patient treatment: this at times caused difficulty, as patients from just outside their districts could be, and sometimes were, refused. Now hospitals can take patients from anywhere in the country; this has sometimes led to local patients having to be told that there is no room for them, particularly if the patient is elderly and likely to occupy a bed for a long time. The previous friendly rivalry between the voluntary and municipal hospitals has been replaced by grumbling from the regional board hospitals that the teaching hospitals get too large a slice of the cake.

The benefits which have resulted are that the former voluntary hospitals are no longer in the desperate need for money that some of them were, and there is no need for street collections and similar means of raising money. There is a better spread of consultants and a reduction of the pressure on central teaching hospitals for specialist advice. Mental hospitals are being brought into closer contact with other hospitals. The level of medical treatment and nursing care is being gradually raised. On the other hand, that close camaraderie between the staffs of hospitals which existed in the London County Council Hospital Service, and no doubt in others, and which was fostered by frequent and regular meetings at County Hall of medical superintendents and specialist groups and by clinical meetings at different hospitals in turn by the London County Medical Society, appears to be declining, and we have a number of individual hospitals without any special feeling of loyalty to their regional boards, and without any firm conviction that they are part of a service, and that there must be real co-operation with their neighbours.

The photographs are reproduced by courtesy of the London County Council from *The L.C.C. Hospitals: A Retrospect*, 1949.

OBSERVATIONS ON HOSPITAL PLANNING

BY

J. O. F. DAVIES, M.D., D.P.H.

Senior Administrative Medical Officer, Oxford Regional Hospital Board

AND

WALPOLE LEWIN, M.S., F.R.C.S.

Assistant Neurological Surgeon, Radcliffe Infirmary, Oxford

In an earlier report (Abel and Lewin, 1959[1]) a substantial increased capital expenditure on hospital building was advocated, and it seems clear that there is now a general acceptance of the idea of more capital investment in hospitals, although views differ widely on the size of this investment. The Annual Report of the Ministry of Health for 1959[2] refers to the passing decade of "make do and mend" and to the future programme of "expansion." For 1961–2 £31m. are promised, but even the Guillebaud Report[3] suggested £30m. a year to be the minimum required for *replacement* costs of hospitals, and that in terms of 1955 money value. Before the war £10m. a year were being spent on new hospitals and major extensions, which compares in value to the £31m. proposed for next year.

At the present rate of progress—and we have no particular reason to suppose that this will be maintained beyond the Government promise to reach a figure of £50m. by 1964–5—it will be 1968–9 before the target of £75m. suggested in the earlier paper is reached, and the National Health Service will have come of age. We still think this figure of £75m. a year a realistic one. To put the expenditure of a sum of £75m. a year on the hospital service into perspective we set out some of the main figures of capital expenditure in the public sector this year: Electricity Council, £285m.; Housing, £285m.; British Transport Commission, £200m. National Coal Board, £120m.; Education, £108m.; Roads, £92m.; Atomic Energy Authority, £42m.; Gas Council, £43m.; Air Corporations, £59m.; Post Office, £91m.; Water, £33m.; Sewerage, £42m.; and Hospitals, £31m. It is clear that the hospital programme so far envisaged does not represent an expansion commensurate with the need.

So far the needs of hospitals have not come within the real range of public consciousness. Hospitals continue to receive letters of thanks for services rendered, but rarely one of bitter complaint at the quality of buildings in which patients are treated. The general public on the whole are unaware that most of their hospitals were built more than 70 years ago, that over one in five was built 100 years ago, and that although there are enough hospitals they are too old and often in the wrong places. The patients are satisfied if they continue to enjoy what has been described as "the best medicine in the world," but few of them appreciate the poor conditions of work under which the medical and nursing staff achieve this quality of care. Our concern is that we may be reaching a stage when the standard of service cannot be maintained with our present hospital buildings. Such a situation would immediately rouse the public conscience.

The Volume of Work

Although we realize that the hospital care of the patient is only an episode in his total medical care, and that most of the illness in the country is treated by general practitioners, nevertheless the load upon the hospital service continues to increase, as revealed by the number of new out-patients attending for consultation and by the number of patients discharged from hospital wards. In the Oxford Regional Hospital Board

area, for example, the number of new out-patients in the last five years has increased by 16%. The number of in-patients treated in the hospitals last year was the highest ever, and yet at the end of the year the list of patients awaiting admission to hospital was larger. There is as yet no indication of a slackening in the demand for hospital treatment.

What is this work that the hospitals are called upon to perform? Our knowledge of morbidity statistics is very slight, but if hospitals continue to provide information to the Ministry of Health and General Register Office on every tenth patient there may be some interesting facts to be learned. The Report on the Hospital In-Patient Enquiry*[4] for the year 1958, which has just been published, gives some preliminary tables for that year for England and Wales. The figures have been analysed in some detail in the Oxford Region, and it has been noted that the commonest causes of admission to hospital in the 0–5 age-group, as might be expected, are for the removal of tonsils and adenoids, and for congenital malformations. In the age-group 5–14 appendicitis comes second to "Ts and As." From 15 to 29 years head injuries are the commonest cause of admission of men to hospital, with appendicitis for women. In this age-group the second cause of admission for men is appendicitis and for women abortion. In the decades 30 to 70 hernia is the commonest cause of admission in men, followed by duodenal ulcer, carcinoma of the lung, and hyperplasia of the prostate. For women, disorders of menstruation and prolapse are the main causes of admission from the age of 30 to 70.

Trauma, as might be expected, is a less frequent cause of hospital admission in women, save in the higher age-groups when fracture of the lower limb is a relatively common cause. The conditions for which patients wait longer than six months for hospital admission are set out in this interim report, and it may well be that something might usefully be done to deal more promptly with some of the commoner conditions like strabismus, hernia, and prolapse. The usual cry is for more beds, but much might be achieved by a shorter duration of stay in hospital with earlier discharge to the care of the general practitioner.

Future Hospital Needs

This rising tide of work is still carried out in hospitals which are essentially the ex-municipal, ex-voluntary, and formerly E.M.S. hospitals. While most of these have been improved so far as out-patient and diagnostic facilities are concerned, and although much may have taken place in the way of modernization of E.M.S. wards, in many places the hospital service is split between more than one hospital. The medical, surgical, pathological, and out-patient facilities for a community may be located in several different hospitals, with all the attendant disadvantages to patients and staff. The structure of many existing hospitals makes further expenditure on them hardly worth while, and the hospitals are valuable probably only for the site which they occupy. In many instances the erection of one sizable hospital would lead to the abandonment of others.

Assuming that the hospital service will get an increasing share of the country's capital, we suggest some of the ways in which the hospitals should be developed and the particular features which will need attention. It is the general hospitals which are dealt with in this paper, but we appreciate that the criticism of existing conditions applies equally to mental hospitals. They were designed in another age and built for a custodial purpose which they should serve to a lessening extent. There must be an integration of the mental and general hospital service by the joint use of medical staff and by providing psychiatric clinics and in-patient facilities in all new general hospitals.

*The Hospital In-Patient Enquiry, which is organized on a national scale by the Ministry of Health and the General Register Office, consists of a 10% sample of patients admitted to all National Health Service hospitals (except mental and mental deficiency) in England and Wales.

Requirements of the Hospital

The general hospital for the future should be large enough to justify at least its own consultant staff in the main specialties and be able to support a pathology and radiology department. In our view a practical minimum size will be in the region of 200 beds. In larger centres there would also be at the general hospital psychiatric beds and geriatric beds, so that a total bed complement would most likely be 600–800 beds. Hospitals smaller than 200 beds are likely to be built only to serve special purposes or in special places—for example, general-practitioner maternity unit or a general hospital in a remote area of Wales. The implication is that many sizable communities will not be able to support a general hospital. Our suggestion for the provision of hospital services in such areas is the general-practitioner maternity unit and a diagnostic centre or peripheral out-patient department staffed by consultants from the general hospital which provides in-patient services for the area. We doubt whether "special" hospitals are likely to be built for the future save for mental deficiency and smallpox. Some hospital departments —thoracic surgery, cardiac surgery, neurology and neurosurgery, plastic surgery and radiotherapy—serve large catchment areas, some for a whole region. These departments, which should form part of a general hospital, will serve a regional need.

Number of Beds Needed

The Hospital In-Patient Enquiry to which we have referred shows that some patients are waiting a long time for in-patient treatment. The waiting period for hernia, for instance, is such that every surgical ward in the country should perhaps have some beds available for the treatment of this condition alone. The duration of stay in hospital for hernia, however, varies considerably, for example, in the Oxford Region it is from 6 to 12 days. It may be, however, that only by allocating beds specifically for such common conditions, which cause much ill-health and loss of working efficiency to the country, can these problems be treated in sufficient numbers and avoid the losing battle with the more insistent claims of other acute or progressive illnesses.

If the cost of hospital beds is put at from £5,000 to £8,000 per bed, the number of beds to be provided is clearly going to be important. Surveys have been conducted in the past in an attempt to ascertain the bed need for the future so far as general hospitals are concerned, and recent estimates range from 2 to 3 beds per 1,000 of the population rather than the older suggestion of 4.5 or more. These surveys have been based on the use that has been made in the past of beds in perhaps inadequately staffed ancient buildings. The most recent study is of the Barrow and Furness area, where there are now 2.5 beds per 1,000 of the population. This particular survey has tried to estimate the extent to which the use of beds was justified. Forsyth

and Logan,[5] in their report on this survey, make the statement that on clinical grounds alone approximately one-quarter of the male and one-half of the female medical patients receiving treatment or investigation in hospital could have been dealt with either in the out-patient department or at home under the care of the general practitioner. The waiting period for beds in the Barrow and Furness area was surprisingly short and the waiting time for consultations was approximately one week.

The number of beds needed is not necessarily the same in all parts of the country. Local industry and even custom have their influence. The number needed may also depend on the adequate development of out-patient diagnostic services which may prevent unnecessary admissions. It will depend, too, on the centralization of modern, well-equipped, well-staffed hospitals in which a reduction in the average duration of stay may be achieved. The provision of adequate domiciliary services to support the general practitioner, thus perhaps avoiding admission to hospital on social grounds and allowing of early discharge to domiciliary convalescence, must also have its influence on bed numbers. If these conditions can be satisfied with new hospitals then the overall number of hospital beds required in the country may not require an increase. Indeed, the figure could well be less. The present number of acute beds in this country is 3.6 per 1,000 of the population. It might well be capable of reduction to 3 beds per 1,000.

Ward Design

A great deal of work on ward design has been done in this country by the Nuffield Provincial Hospitals Trust, who have erected in Northern Ireland and in Scotland experimental wards which are now the subject of intensive study. These are large wards—32 to 40 beds, which is a number greater than it has in the past been thought possible for one sister to supervise. They seem, however, to be working well in practice.

The wards are broken up into bays of four or six patients, and there is a generous proportion of single rooms. This grouping of patients allows of their distribution according to their medical or nursing needs. Wards have in in the past been designed with rigid separation of the sexes, thus making it practically impossible to vary the bed allocation according to the demand by sexes. Nursing facilities in the new wards are so placed as to diminish the amount of walking. Attention has also been paid to cross-infection, and treatment rooms have been provided so that dressings may be undertaken in the controllable conditions of a special room rather than in the open conditions of the ward. An air-conditioned dressings room should be one essential of every surgical ward.

A design of this kind is reasonably flexible. The call for flexibility in ward design, a request which is made by all clinicians, can be brought about only in single-story construction, which limits the size of the hospital, or by the provision at the time of building, of a uniform grid of services available at every point, few of which would be in use at any one time. Such construction would be costly in the extreme, and unjustifiable without a certainty that change would be made in a short time.

It is questionable whether all the beds in the hospital need to be costly, and for the future it might be desirable to build hospitals with larger and more comprehensive out-patient departments, supplementing the beds for acute cases with recovery units of simple construction on the hospital site—not in a convalescent home at some distant point on the coast, which inevitably means a division of medical care. The simple recovery units should cost much less than hospital beds for acute cases, and might possibly be of more or less standard design, making for economy in construction.

Another idea which should be tried out is the establishment of intensive nursing-care units. Patients requiring 24-hour observation are admitted to such a unit, either one for the whole hospital or one for each of the medical and surgical divisions. Transfer from the intensive care unit to the general ward takes place when the need for continued observation and special nursing care diminishes, usually after 48 hours or more. The advocates of this nursing arrangement speak strongly in its favour, especially in circumstances where medical and nursing staff are limited. It is to be hoped that some hospitals may experiment with this type of nursing unit as well as the simple type of recovery unit mentioned above.

The present practice in this country of housing an infected patient in a side-room off the Florence Nightingale ward—the one in which most of the hospital medicine in this country is practised—has been patently demonstrated to be inadequate. The infected patient should be removed from the clean ward, and the hospital for the future will need on the same site a separate building containing a range of cubicles capable of being cross-ventilated and designed to minimize the possibility of cross-infection. It is desirable that this block should have its own theatre in which frankly septic cases can be dealt with without ever being admitted to clean hospital wards.

Operating Theatres

The number of theatres to be provided needs careful assessment to ensure the economic use of surgical beds.

However, their number needs to be sufficient, so that no one theatre is "overworked," a main factor in preventing hospital infection. An additional theatre, moreover, allows a regular programme of cleaning without disrupting the surgical services of the hospital. Theatres are best designed in groups rather than stacked one above the other. The recovery ward, at least for general surgery, has come to stay and its relation to the theatre must be close. For some specialties there may be a case for siting a theatre immediately adjacent to the ward, thus obviating the need for post-operative recovery beds. Air-conditioning is a *sine qua non*, and the system must provide for temperature control. With cross-infection so prevalent it is important that the clean area of a theatre should be clearly defined and that no one who is not suitably attired should enter it. Much thought is being given at the moment, and more is required, to the design of theatres so as to allow surgeons and nurses to walk into them with sterile clothes without being contaminated, and also an arrangement which involves the least amount of movement within a theatre.

Out-patient Departments

The steadily increasing number of hospital out-patients will, as suggested earlier, necessitate the construction of larger and more comprehensive out-patient departments, and the more investigation and treatment that can be carried out in the out-patient department the more satisfactory for the patient and the less costly for the hospital service. A few hospitals have beds associated with the out-patient department only. To these beds are admitted patients who have under-

gone surgical procedures which, after a few hours' observation, allow of discharge home to the care of the general practitioner. It seems clear from the studies of Forsyth and Logan[5] that such beds might also be used by medical patients. Crombie and Cross[6] estimated also that of a 10% sample of 5,400 medical patients in a Birmingham hospital in 1955 25% had no diagnostic or therapeutic requirement at the hospital level. This suggests that out-patient facilities, suitably extended so far as building, equipment, and staff are concerned, might well take a substantial load from the hospital in-patient service. It is important that the out-patient department, with its *x*-ray and pathological services, as a growing point of the hospital, should be located on the ground floor and that each department be so designed as to be capable of extension. If, for instance, the pathology department is located on the second floor of a monobloc, extension presents a problem.

Accident Departments

Death on the road has focused the public attention on accidents. Accidents on the roads, at work, and in the home have assumed major proportions, and the proper arrangements for their care should now be an essential part of the hospital services. More than one committee has now been set up to consider the problem of accident departments, and a number of reports can be expected in the near future. There is growing support for an accident service or department at designated hospitals which would deal with all the accidents for an area. Such a service would have a 24-hour medical and nursing staff, and in most instances would be part of a main general hospital and have available the ancillary services such as pathology and radiology. The casualty department, with which all medical men are at the moment familiar, admits a high percentage of "casuals" and a relatively small percentage of "casualties." Fry[7] has shown that a large number of patients attending the casualty department of a London teaching hospital could more properly have been treated by general practitioners. Crombie[8] has shown at Birmingham that a high proportion of patients attending casualty departments are "casual" patients.

It is questionable whether the hospital service should continue to carry this load. If the hospital is to continue to deal with "casuals"—that is to say, if hospitals are to have an "open door" policy—then the staffing of the casualty departments as opposed to accident departments might best be undertaken by experienced general practitioners. They could provide continuity of service in a field which at the moment is ever changing.

A corollary of the separation of casualty and accident departments is that there will be fewer but better accident departments. Not every hospital will treat accidents, and although this proposal may be distasteful to some hospitals it is a development that will have to come in some of our large cities. The principle of a central accident service at a main general hospital integrated with smaller peripheral units has already been outlined in the Report of the British Orthopaedic Association.[9] Where time is a factor it is better used getting the patients to the right hospital rather than to the nearest hospital.

Central Sterilization and Supply Department

The Central Sterilization and Supply Department which has been developed for some years in the Services is now being more widely adopted. It furnishes all parts of the hospital with pre-packed sterile goods, and no sterilization takes place on the wards. While there is an increased outlay on instruments there are compensatory savings on autoclaves. The C.S.S.D. may be located near to the operating theatre, with the possibility that it can also deal with operating-theatre instruments. The staffing of these departments does not make demands on the nursing staff but eases the task of both doctor and nurse on the wards, in out-patient departments, and in operating-theatres. The introduction of disposable items of equipment promises to lessen the labour problems even further. As many pathologists have pointed out, the practice of "sterilizing" items on wards is as archaic as the hospital buildings.

Operational Research

Most of the operational research that has been conducted in this country so far has been done by voluntary bodies like the Nuffield Provincial Hospitals Trust or university departments. The Nuffield Trust has done first-class work in its studies of the function and design of hospitals, of sterilizing procedures in hospital, of the accident service (shortly to be published), of the radiological service (now the subject of study), and on hospital case load in the Barrow and Furness group of hospitals. In prospect is the study of the mental hospital service by P.E.P., financed by the Trust. A vast number of studies remain to be carried out, and what is needed is a central intelligence body stimulating—and more important, financing—boards of governors, regional hospital boards, and university departments to find answers to the many questions still outstanding, all of which will have an implication in hospital building. It may be questioned why regional hospital boards have not set up departments to investigate their own workings over the past 12 years. A good case can be made out to show that this kind of investigatory activity is best left to outside independent bodies, who have no axe to grind, who can finance such investigations adequately, and who only seek to improve the efficiency of the service in the interests of all who work in it and receive service from it. There is good reason to believe that the Ministry of Health is going to take on some of these operational research functions, supplementing the work done by private bodies.

One of the most important tasks of all is to examine a new hospital or department after a reasonable period in use and take a profit from the lessons to be learned. This kind of examination may involve prolonged and patient study and a ready admission of mistakes in planning, which no one likes to make. Action along these lines will give boards of governors, regional hospital boards, and the Ministry of Health an increasing amount of knowledge at present lacking in this country. Coupled with this research into success and failure of design is needed some advisory machinery to bring the lessons to be learned before those interested in planning. This should lead to the establishment of a Central Intelligence Service which would make the latest information on design available to anyone concerned in planning.

Another problem is the degree to which it may be possible to accept some basic designs and so cut down the time taken to bring a hospital project from conception to fruition. The delays are not only with the clinicians, the planners, and the Ministry—they are also with the architects and building contractors. There is a good deal to be learned from the Americans, whose working drawings on the agreed plan take eight months

as opposed to two years in this country. The American counterpart of the Ministry of Health has assisted sponsoring bodies in America to build 4,000 hospitals under the Hill Burton Programme.* This assistance has been not only in the provision of money but in the provision of information in the form of guide material which has given the outlines of requirements and suggested layouts for all departments of hospitals of all sizes up to 600 beds. There is a need for information of this kind and in this form in this country now.

Staffing

In thinking ahead to the time when the new hospitals are provided, to what extent are our staffing problems linked to the need for new hospitals and what particular problems confront us ?

Medical

Everyone is aware of the difficulties in securing junior resident staff in the hospital service, particularly in casualty departments. In the Oxford Region over the past two years 47% of the registrars and 54% of the casualty officers qualified outside the United Kingdom. It is not suggested that the hospital service should cease to be a training-ground for doctors from the Commonwealth—far from it. Indeed, without them resident medical staffing in some of our hospitals would break down altogether. This shortage of junior personnel, which is the subject of an inquiry by a working party, is not, of course, unconnected with the difficulty of securing entry to general practice. The applicant for a practice who appears to have climbed part of the way up the hospital consultant ladder seems, unfortunately, to be regarded as being less fitted for general practice. A fresh approach between general practitioners and consultants on this problem is urgently needed.

There are shortages of consultants in some of the specialist fields, notably psychiatry, anaesthetics, and radiology, though the number of applicants for consultant posts in general medicine and general surgery is still very high. The publication by the Ministry of Health of the numbers of doctors in the various specialties, with the dates of birth, has made it clear that prospects in some fields of medicine will be brighter than in others for some years to come. Prospects of success, however, and inclination do not necessarily run well together ; even so, many young men have changed their direction in the hospital field. We cannot hope, nor should we try, to provide a 24-hour resident medical staff for all our hospitals. Some centralization of services as outlined in this paper may well lead not only to a more efficient service but to a lessened demand for junior staff.

Few of our hospitals possess adequate accommodation for medical staff—that which exists is as old as the hospital or has been converted from premises devised originally for other purposes. Still fewer hospitals have quarters for married doctors. To attract and keep suitable junior resident staff, adequate accommodation for single and married doctors will be essential.

Nursing

The ever-increasing demand for more nurses may overlook the considerable increase that has already taken place. In the 10 years 1949–58 the number of nurses of all grades employed in hospitals increased by 31%, from 139,526 to 183,105.

The amount of work, and, more important, its intensity and complexity, have increased as well. There is, however, little to suggest that the nursing services can expect to attract a further sizably increased percentage of girls leaving school. It follows that if the nursing service is to cope with the demands made on it then much of the solution must come from the harnessing of our present resources. The *student nurse* should be encouraged to complete her training: of 20,000 student nurses recruited in one year recently no fewer than 8,700 failed to complete their training. A broad interest of work in a number of departments in a main hospital, better working conditions in new hospitals, and the provision of good nursing accommodation, probably in the form of flatlets away from the hospital, may all prove helpful. Most important, however, will be to realize that a nurse's time is going to be increasingly valuable and should be spent on nursing. To this extent new hospitals which can improve hospital intercommunication, provide central supplies, and improve ward design will help us to use our nursing services to the best advantage.

The *assistant nurse* has played an ever-increasing part in the nursing service, and, indeed, many hospitals could not continue without them. The proposals of the General Nursing Council to allow student-nurse training to be undertaken only in hospital groups of a least 300 beds and to raise the standard of education are designed in part to provide fewer general training schools and therefore more and better opportunities for the training of the assistant nurse. We shall certainly need both, and the new proposals for nurse-training should be examined with all these points in mind.

In addition, there is the growing army of *part-time nurses* of all grades, and this could be encouraged. In 1958 there were 41,176 part-time nurses of all grades. This will not necessarily mean a falling off in the standard of nursing care. A married woman, the demands of whose children have lessened, may well make an excellent nurse, devoting a continuity of care which in the hospital service generally is unusual, except perhaps in the case of ward sisters. This return after marriage to an earlier professional activity is now being actively advocated for the teaching profession, and we would do well to explore its possibilities in nursing to the full.

The whole problem of staffing in new hospitals may well require a fresh review. These comments on medical and nursing services have their counterpart in the ancillary services, including almoners, physiotherapists, and radiographers. It is clear that the fuller integration of the service and better working conditions would ease the not dissimilar problems in these branches of hospital work.

Conclusion

Our object in this paper has been to draw attention to the inadequacy of the present financial arrangements to rebuild our hospitals and to suggest that, quite apart from the need to replace antiquated and uneconomic buildings and to provide accommodation in keeping with the present standards of living, there are other cogent arguments to advance in support of a more rapid hospital-building programme. There is no evidence at present to suggest that the demand for hospital services is falling. Indeed, it has increased, and it is difficult

*Under the Hill Burton Programme the Federal Government has made "matching contributions" to assist in the building of new hospitals. These contributions vary from one-third to two-thirds of the total cost of the hospital. The local sponsoring body may be public or private, but the hospital must be non-profit-making and provide a community service.

to see how much more can be done with our existing resources without a falling off in our standards of care. The rise of hospital infection, with its morbidity and mortality, is a grim warning of what may be in store unless the public conscience is roused to demand more new hospitals sooner. It is also suggested that the more efficient use of our personnel in modern hospitals —the replacement, for example, of two outworn hospitals for one fully equipped one—may make a significant contribution to the problems of medical, nursing, and ancillary staffing.

In addition, some observations are made on what seem to be important points to consider when designing new hospitals. They are not intended to be exhaustive but to serve as items for discussion. The need to marshal such knowledge as we have of hospital needs and hospital building is stressed, and through a central intelligence service this information should be immediately available to anyone called to help in hospital development.

Finally, we would stress again that in the space available we have concerned ourselves solely with general hospitals. The problems of mental hospitals, for example, and other special hospitals are no less insistent; nor have we explored the role of the local authority or the part which it is hoped the general practitioners will play within the hospital service. Discussion on hospital building reflects vividly the overlap of the three arms of the National Health Service and the need for the fullest co-operation and integration. Indeed, at peripheral level the hospital provides the only possible meeting-ground for all the professional elements of the service. Is it too much to hope that in the construction of new hospitals this will be recognized and definite meeting-rooms made available in which the medical and other workers in the National Health Service can come together to deal with the problems which affect them all?

REFERENCES

1 Abel, A. L., and Lewin, W., *Brit. med. J.*, 1959, **1**, Suppl. p. 109.
2 *Report of the Ministry of Health for the Year Ended 31st December 1959*, Part I. Cmnd. 1086. H.M.S.O., London. 1960.
3 *Report of the Committee of Enquiry into the Cost of the National Health Service*. Cmd. 9663. H.M.S.O., London. 1956.
4 Report on Hospital In-Patient Enquiry for the Year 1958. Part I. H.M.S.O., London. 1960.
5 Forsyth, G., and Logan, R. F. L., *The Demand for Medical Care:* A study of the case-load in the Barrow and Furness Group of Hospitals. Oxford Univ. Press, London (for the Nuffield Provincial Hospitals Trust). 1960.
6 Crombie, D. L., and Cross, K. W. (1959). *Med. Press*, **242**, 316, 340.
7 Fry, L. (1960). *Lancet*, **1**, 163.
8 Crombie, D. L. (1959). *J. Coll. gen. Pract.*, **2**, 346.
9 British Orthopaedic Association, "Memorandum on Accident Services, 1959." *J. Bone Jt Surg.*, 1959, **41B**, 458.

ARCHITECTURAL PROBLEMS OF NEW HOSPITALS

BY

RICHARD LLEWELYN DAVIES, M.A., F.R.I.B.A.

Director, Division for Architectural Studies, Nuffield Foundation; Professor of Architecture Elect, University of London

It has been said that it was lucky that our economic difficulties prevented us from building any hospitals in the decade immediately following the war, because our ideas of what a hospital should be like have changed so radically in this period. They have indeed changed, but of course they are still changing, and it is by no means certain that the rate of change has slowed down very much. However, we have now to build a substantial number of new hospitals to replace many which are hopelessly out of date and uneconomic, and we therefore have to take decisions now which will establish the pattern of hospital building in the next few years. The ability to meet changing need must be a first consideration in design.

Buildings have a considerable life. Even lightly constructed modern buildings will last, so far as structural soundness is concerned, for 50 to 100 years. Over such a period we must expect many changes in use. It has sometimes been argued that we ought to try to put up hospitals in a very temporary form, designed to last only a short period. However desirable this may be, it is not possible; building structures have to be designed to stand up against certain maximum stresses imposed by the British climate, including rare events such as gales of 100 miles an hour. If they are strong enough to stand up with certainty for one year they will be strong enough to last for 50 years. Buildings are expensive and we cannot afford to plan on the basis of a very short life for our hospitals. We must therefore try to design hospitals which, although structurally long-lived, are flexible enough to remain efficient under changing use.

There is more than one way of approaching the problem. One approach, which was strongly urged a few years ago, is to use buildings which are, in large measure, demountable. These buildings, it was hoped, would be composed of unit parts which could be taken apart and reassembled easily whenever necessary. Amongst other attractions this idea appeared to absolve hospital planners from the need to think very carefully about function; it presupposed that the building could always be rearranged to fit any type of use. Unfortunately, demountable building is not really practical. Complex modern buildings, like hospitals and laboratories, are an assembly of services—heating, lighting, ventilation, and drainage—they do not consist merely of walls and floors. To change the use of a building therefore involves not merely unscrewing and reassembling wall panels, but also changing the position of sinks, wash-basins, lights, power points, etc.

Attempts have been made to provide for freedom for rearrangement of services, but this means installing a tremendous network of service lines with take-off points in all possible positions. In any given arrangement of the building, only a very small proportion of the service lines are in actual use, and therefore buildings with this degree of flexibility are prohibitive in cost. Again, it has been found that demountable walls, with numerous channels and ducts for services, make effective soundproofing impossible and present difficult problems in hygiene and control of infection. There is little likelihood that we shall solve the problem of soundproofing demountable walls, as the soundproofing properties of

the wall are directly related to its weight, and a wall heavy enough, for example, to give privacy between two adjoining consulting-rooms is far too heavy to be demountable. Hence the idea of demountable building, which appears at first to be so attractive, is now generally recognized not to offer any general solution to the problem of flexibility in use.

How then, can we plan our hospitals to accommodate change? We have recently developed certain design techniques which go a long way towards solving this problem. Two principal approaches are involved—one concerned with the general planning of the hospital site as a whole, the other with the detailed design of individual departments.

Planning for Growth and Change

Traditionally, buildings have been designed as a single static entity. The Parthenon and the Royal Palace at Versailles are finished buildings in which every part has been designed in relation to the whole; nothing can be added or taken away from such a building without disrupting it, both functionally and aesthetically. Most hospitals in the past have been designed like this, and unfortunately some still are. But another approach is possible—organic design which allows for growth. A Cotswold village exists as a functional and architectural entity, but it has grown over time; its layout has permitted change and expansion without disruption. We now recognize that the design of a hospital should be looked at almost as a problem in town-planning rather than architecture. Hence, in working out a site plan for a hospital we think in terms of town-planning concepts, such as traffic routes and the zoning of areas for development. It is possible to develop plans which permit ordered growth and change, and which enable various departments to be added to from time to time, without cutting traffic routes or invading space already used for other purposes. In such planning the placing of supply departments such as kitchens, laundry, and stores in relation to the service routes is of great importance. It is also necessary to identify those departments which are most likely to expand substantially, in order to ensure they are placed so that they can do so.

Some general principles are already clear; one is that it is a disadvantage to embed one department within another if this can be avoided. For example, if the operating-rooms are embedded in the ward building, it will be very difficult to allow for the expansion or alteration of both wards and operating-rooms. A certain looseness of planning is necessary to allow for growth of individual parts, and this may well be worth it even at the cost of some little separation of one department from another. In other words, the ideal plan for the hospital *now* may not be ideal if we envisage the hospital as something living and growing over a number of years. It is very difficult to extend any buildings vertically, and in a hospital it is particularly difficult to add an additional floor while keeping the existing building in use. Hence provision for growth is best made horizontally. From this follows the general principle that low buildings are better than high ones wherever much growth or change is envisaged. Here again the principle of flexibility is in conflict with compactness and militates against highly compact solutions. To achieve a wise balance we may try to distinguish between those parts of the hospital most susceptible to growth and change, and those which are relatively static. The former are best planned loosely in low buildings, while the latter may be grouped more compactly in tall blocks.

Without much question, the wards form the most static portion of the hospital, both quantitatively and qualitatively. We now know pretty well how to relate the number of beds in a hospital to the population it serves, and we have no strong grounds for believing that the demand for beds will increase very much in the foreseeable future. Hence if we build a hospital of, say, 600 beds to serve a given population, and these beds are so planned as to be usable by any specialty, we do not expect to have to add to them very much—unless, of course, there is an increase in the population served. Again, the requirements for the nursing care of a sick human being, while they change slowly with changing culture, are not susceptible to the dramatic variations which we have seen and expect to continue to see in the departments such as *x*-ray, operating-rooms, etc. A well-designed ward built to-day may still provide acceptable conditions for nursing patients in 30 years' time; it is unlikely that an *x*-ray suite built now will be functioning unchanged after 10 years. Thus, if we consider flexibility and freedom for growth as an important objective, the conclusion is in favour of low, rather loosely planned buildings, with the ward block as the only portion rising to any considerable height.

Convenience and Efficiency

But flexibility is not the only consideration; convenience and efficiency in use can also be regarded as a major objective in good hospital design. Many of our older hospitals, planned in a horizontal form with low buildings, are very inconvenient and costly to run. Where food, linen, etc., have to be transported long distances by trolley, many porters have to be employed,

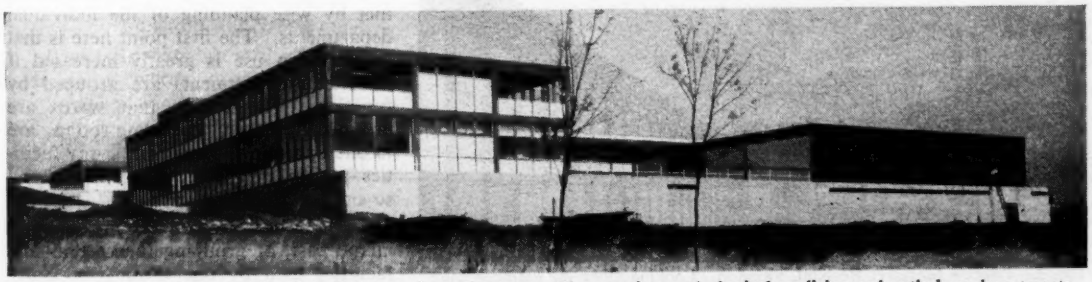


FIG. 1.—Princess Margaret Hospital, Swindon, from the west. The superimposed physical medicine and pathology departments are on the left and the operating department on the right, showing their stone-faced podium. (Consultant Architects: Richard Llewelyn Davies and John Weeks. Architects: Powell and Moya.) (Reproduced by permission of *Architectural Review*.)

and staff and patients' time is wasted by long journeys from one department to another. In America, much attention has been devoted to developing labour-saving methods of transport and communication within hospitals, and certain American hospitals are remarkably efficient in this respect. A number of new hospitals recently built in Kentucky and West Virginia by the Miners' Memorial Association have achieved striking economies in running. It is claimed that in these hospitals the ratio of staff to patients has been dramatically cut. This economy is achieved by placing all wards in a tower block which rises above the kitchen, laundry, and central stores. All supplies to the wards are delivered vertically by lifts, conveyors, or pneumatic tubes.

These hospitals are revolutionary in organization as well as design, and indeed the design depends on the organization. The possibility of direct delivery of supplies from kitchen, laundry, and stores to the centre of the ward floor has been exploited to the extent of doing away with most of the normal ancillary rooms and practically eliminating local storage. In place of store cupboards, each ward unit has a stock of supply trolleys which are sent down daily for replenishment in the central stores. Nothing is stocked or prepared in the ward kitchens: even a glass of milk is sent up from the central kitchen. In fact, the ward kitchens are little more than service points connecting with the main kitchen. The effect of these changes on the organization of the ward is, of course, very great, and these hospitals contain no identifiable ward unit comparable with what we are used to in this country. As a logical development of the supply system, the "race-track" ward plan has been evolved. The ward block is a thick, rectangular, or even square building, with patients' rooms on the outside; the centre core, which must be artificially lit and ventilated, contains the lifts, conveyors, and service rooms. (The "race-track" plan has been recently advocated for use in this country, but it should be noted that there is little justification for it except when the revolutionary methods of supply and storage are also adopted.)

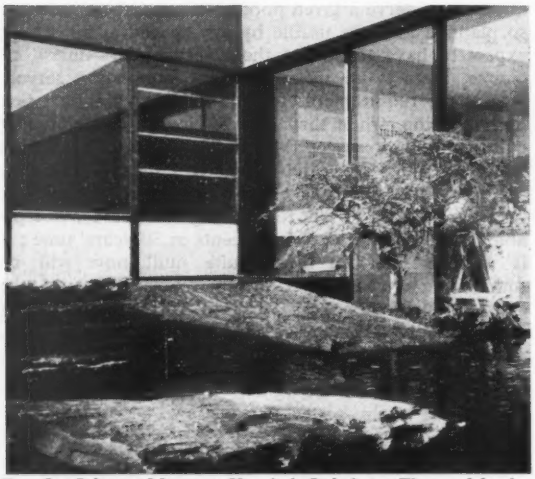


FIG. 2.—Princess Margaret Hospital, Swindon. The pool in the garden court enclosed by the out-patient department. (Reproduced by permission of *Architectural Review*.)

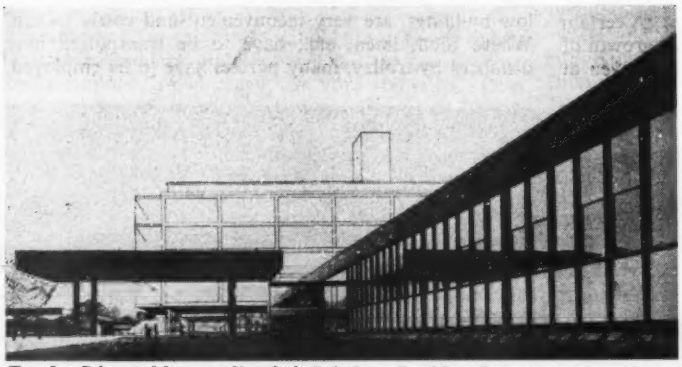


FIG. 3.—Princess Margaret Hospital, Swindon. Looking along the entrance front, past the out-patient and casualty departments. The main ward block to be built as part of the second stage is shown diagrammatically. (Reproduced by permission of *Architectural Review*.)

Most of the hospitals in which this vertical service system has so far been installed are rather small—between 150 and 300 beds; but larger hospitals are now being designed on this principle both in Great Britain and in the United States. There is, however, an upper limit to the size of hospital in which the system in its simplest and most efficient form can be used. This limit is set by the ward block. A single block containing 200 to 300 beds is already a large building, comparable in size to a large office block; a building of 800 beds in a single block is a very big thing indeed, perhaps 300 feet (91 metres) long and 10 stories high. It is likely to be far bigger than any other building in most towns. Probably from the point of view of both its outside appearance and its interior character a building of this size is near the limit of tolerance in many situations. Hence, if we need to plan hospitals much more than 800 beds in size, we may be driven on the grounds of general amenity to divide the wards into two or more separate buildings. When this is done many of the advantages of vertical planning disappear at once, as most journeys will involve horizontal travel as well as vertical movement. Fortunately it does not appear probable that many new hospitals in this country will exceed 800 beds in size, but even this figure presents difficulties when we try to plan the wards in a single building.

Design of Individual Departments

Imaginative, organic design of the whole hospital can provide for long-term growth and change. A hospital planned with good circulation routes, and with space for growth where it is needed, can accept slow changes, spaced over 10, 20, or even 50 years. But there is another problem—the need for flexibility in use day by day, or year by year. This need can be met by wise planning of the individual departments. The first point here is that flexibility in use is greatly increased if individual departments are grouped by function. This means that wards are grouped together, operating-rooms are in one operating department, *x*-ray facilities are in one *x*-ray department, and so on.

The alternative arrangement, common in the past, of grouping together all the facilities used by one medical specialty militates against freedom and flexibility in use. For example, in the Westminster

Hospital, completed in 1939, the out-patient clinics are housed on each floor, adjoining the corresponding wards. Thus, on one floor there will be wards and out-patient clinics for general surgery; on another, wards and out-patient clinics for orthopaedic cases, and so on. But the balance between in-patient and out-patient work varies as between specialties, and even within one specialty the balance can change rapidly with changes in medical care. With the Westminster plan there is a fixed ratio of space for in-patient and out-patient work in each specialty, and there is no easy way of adjusting the accommodation to meet changes in the pattern of work.*

With the other arrangement, now general, where all wards are grouped in one block and all out-patient clinics are grouped in one area, it is much easier to meet the needs of a medical specialty which finds a change in its work. More or less ward space and out-patient clinic space can be allotted to each specialty to meet current needs. Similar reasoning applies to the grouping of operating-rooms, *x*-ray facilities, and laboratories.

Thus a substantial measure of flexibility is obtained at once by the simple decision to group departments according to function. A hospital with a ward block containing wards designed to accommodate any specialty, with an out-patient department with general-purpose clinical suites, and with central operating and *x*-ray departments can meet a wide range of different patterns of use without any physical alterations simply by allotting elements of space according to the need of each specialty or service. But this freedom to allocate elements of space calls for a special approach to the design of the individual departments; each department must be composed of elements or units which can be used equally well by any specialty within a certain range. An appropriate design method has lately been advocated by John Weeks.† This method, known as "duffle-coat" planning in contradistinction to "tailored" design, consists in seeking unit plans which fit a certain range of methods of work, rather as the Naval duffel-coat, manufactured in only a few sizes, provided effective covering for a wide range of sizes of sailors. But it is fatal to guess at a general-purpose design; the only safe way to proceed is the hard way, by very careful detailed study of the needs of all the different kinds of work within the range it is hoped to cover. When we can design a tailor-made plan for each different way of working, then, and only then, will we be in a position to see what might be a possible duffel-coat solution for all. Fortunately, a fair amount of this preliminary study has been done, and tried techniques are available for prosecuting it.‡

Function and Design

These close studies in the function and design of wards, operating-rooms, and out-patient clinics represent a characteristic British contribution to the topic of hospital design. They start in all cases with the consideration of a human group or team engaged in the care of the patient—a group of doctors and nurses. The designs which result are always based on the working of a team, whether in a ward, an operating-room, or an out-patient clinic. Thus the experimental ward block at Musgrave Park Hospital, Belfast, is based on units of 20 beds, each cared for by a nursing team. Similarly the out-patient suites at the Princess Margaret Hospital, Swindon, are based on the teams of doctors conducting the clinics. In both cases each unit is made self-contained so far as is possible, and is planned to take in a wide range of ways of working.

What are the limits to which this idea can go? What are the exceptional functions which cannot comfortably use general-purpose accommodation? We already know enough to answer some of these questions.

So far as wards are concerned the obvious exceptions are children and expectant mothers. The recommendations of the Platt Committee§ confirm the need for a special form of accommodation for children. There should be a separate entrance to the children's unit, and ready access to a garden or terrace from all children's wards. These considerations will generally result in a children's block, built at low level and close to, perhaps abutting, the main hospital. The needs of the maternity unit also differ greatly from that of most other departments in the hospital, and here again it is desirable to have a separate entrance if possible. In addition to children's and maternity units, there is some case for providing special accommodation for the psychiatric unit. Here it is not a question of wishing to separate psychiatric patients from others, but there is a practical difficulty in providing sufficient free space for recreation and therapy within the ordinary ward unit, and free access to a garden is desirable.

So far as operating-rooms are concerned the two principal services which should have their own operating-rooms, separate from the main operating department, are the casualty and the out-patient departments. There is also some case for planning a small special operating-room for the eye department adjoining its own wards.

Future Character

What are our new hospitals going to look like? What will be the results of the approach discussed above on architectural design? A few new hospitals have now been completed and there are already some indications of the architectural character we are going to see.

Planning to allow for growth and change will mean that our future hospitals will have a good deal of low

FIG. 4.—Nuffield House, Musgrave Park Hospital, Belfast. Exterior view of the south-east façade. (Architects: R. Llewelyn Davies, John Weeks, and the team of the Nuffield Foundation Division for Architectural Studies.) (Reproduced by permission of de Burgh Galwey.)

*The Westminster design had a very real purpose in its time—to break down an artificial division which then existed between in-patient and out-patient work.

†Planning for Growth and Change, J. Weeks, *Archit. J.*, 1960, **132**, 20.

‡*Studies in the Functions and Design of Hospitals*, Nuffield Provincial Hospitals Trust. Oxford University Press. 1955.

§*The Welfare of Children in Hospital*, Central Health Services Council. 1959.

building of an informal character. Fig. 1 shows a portion of the new Swindon hospital with one- and two-story buildings for the departments of pathology and physical medicine. Fig. 2 shows a small garden planned in a courtyard within the single-story out-patient department at the same hospital. Fig. 3, also taken from the new Swindon hospital, shows the low buildings for the out-patient and casualty departments, with the future, higher, ward building sketched in the background. Fig. 4 shows the ward block at the Nuffield experimental hospital building at Belfast. Here the treatment of the façade reflects the interior organization of the ward into small nursing units, two on each floor.

These examples suggest that the hospital of the future may perhaps draw architectural inspiration from the size and shape of the functional units within it, whether they be nursing units, out-patient clinics, or other units of care. By expressing these working units in the architecture we can break up the very large masses of building which go to make a modern hospital, and create a more human scale, and an environment more comprehensible and reassuring for the patient.

HOSPITAL CENTRAL STERILE SUPPLY DEPARTMENTS*

BY

V. D. ALLISON, M.D., D.Sc., D.P.H.

The Laboratories, Belfast City Hospital, Belfast

The purpose of a central sterile supply department (C.S.S.D.) is to supply all departments of a hospital—theatres, wards, out-patient and casualty departments—with complete, sterile (and the accent is on "sterile") equipment ready and available for immediate use in the treatment of patients. The only exception to this may be the theatre instruments, which are generally kept, cleaned, sterilized, and used in the theatre suites.

The essentials of the department are correct design, modern plant, skilful operators, and a proper work-flow. Regular skilled maintenance to avoid breakdowns of plant, especially steam-pressure sterilizers, is also essential. The basic equipment consists of steam-pressure sterilizers and hot-air ovens, which provide a uniform standard of sterility of supplies throughout the hospital—a much higher standard than prevails where decentralized boiling-water sterilizers, used for instruments, bowls, syringes, etc., are scattered in wards, theatres, and out-patient and casualty departments, and are manipulated by many persons engaged in multifarious duties. Other advantages include decreased maintenance and replacement costs of expensive equipment, more time for the nursing staff to devote to nursing care, better care and maintenance of instruments and utensils resulting in longer life, and fewer losses of items due to control from the centre at all stages. But perhaps the greatest value of a C.S.S.D. is the supply of sterile equipment designed to suit every procedure in ward or theatre, and the sterility of which can be guaranteed—a further step towards the prevention of hospital infection.

All new and projected hospitals in the United Kingdom include the provision of a C.S.S.D., and many existing hospitals are actively engaged in planning or constructing such a department. The C.S.S.D. in Nuffield House, Musgrave Park Hospital, Belfast, is unique in that it was the first department of its kind to be established within the framework of the National Health Service of the United Kingdom, although the system has been used by British military hospitals during and since the second world war. Nuffield House, an 80-bed surgical unit, was built by the Northern Ireland Hospitals Authority, to the design of the Division of Architectural Studies of the Nuffield Foundation, as a research project on the function and design of hospitals; this building incorporates a C.S.S.D.—a special project designed as a joint investigation, by the Northern Island Hospitals Authority and the Foundation alike, into the value and economics of such a department.

As part of their original investigation the Division had reviewed current practice in centralized departments of this kind in countries abroad, and it was convinced of the need, in the interests of hygiene, safety, and efficiency, to centralize those less personal services such as sterilization, linen, etc.

The Division considered that there was valuable experience to be gained in experimentally grafting a centralized service of this sort on to an existing hospital organization. It therefore welcomed the Northern Ireland Hospitals Authority's invitation to do so at Musgrave Park Hospital. The planning of the department is based on preliminary study, from North American experience, of the flow pattern and general space allocation thought to be desirable.

Whereas syringe supply had previously been the subject of an investigation in this country (Nuffield Provincial Hospitals Trust, 1958) the lack, in a British civilian hospital, of a central service of sterile equipment prevented the Division from carrying out functional studies as a prelude to design. The likely load, the equipment provision and placing, storage, working methods, and production flow had therefore to be envisaged in the absence of precise information from time-and-method studies or previous records. Information collected *ad hoc* on the daily numbers of procedures carried out throughout the hospital and in an acute surgical ward in the teaching hospital formed a basis of calculation in deciding the size of certain equipment. The department is a prototype capable of certain modification as work in it progresses.

The planning of the C.S.S.D. has been steered by a technical subcommittee, which includes representatives of the Northern Ireland Hospitals Authority, the hospital itself, and the Nuffield Division of Architectural Studies, drawing upon the knowledge and experience of the bacteriological, medical, nursing, and administrative staffs. The subcommittee now includes the sister-in-charge of the C.S.S.D., and has met monthly during the last five years to consider problems and to discuss new procedures or alterations to existing procedures in the light of experience, and has given a most valuable contribution to the organization and smooth running of the department.

Nuffield House is attached to Musgrave Park Hospital, which is a general hospital with 701 beds, 302 of which are medical and 399 surgical (239 orthopaedic, 80

*Opening address at a symposium on "Sterilization and Central Supply," organized by the Wessex Regional Hospital Board in Portsmouth for senior administrative medical officers.

general and surgical, and 80 gynaecological). The hospital, consisting mainly of wartime prefabricated buildings, is earmarked for reconstruction, of which Nuffield House is the first stage. In the planning of the work of the C.S.S.D. it must at this point be made clear that Musgrave Park Hospital has no out-patient clinics or casualty department, which may have considerable and unforeseeable demands for sterile supplies.

Layout

The C.S.S.D. (Fig. 1) has a floor area of 2,210 sq. ft. (205 sq. m.) and has four main rooms.

1. Receiving and Clean-up Room

This is the entry to the C.S.S.D. and has a Dutch door. All used goods, except fabrics, are collected from the wards by C.S.S.D. staff in stainless-steel trolleys, kept for this purpose; trolleys are disinfected with "savlon" (hospital concentrate, 1-200). Returned equipment has been rinsed in the wards or theatres after use. Material from the theatres on the floor immediately above the C.S.S.D. is returned in a "dirty" lift, which opens into this room; beside the lift is a hatchway which opens to the outside for transport of used or soiled linen from the theatres to the laundry.

The room is fitted with a stainless-steel bench and double sinks used for disassembling, cleaning, and processing. Syringes are disassembled, washed, and passed through a "soni-cleaner," a tank containing a liquid subjected to ultrasonic vibrations. The capacity of the tank is 80 2-ml. syringes, and the time taken to clean them is 10 minutes. Needles inserted in foam-rubber sponges are also cleaned in this tank, 200 at a time, after being soaked in disinfectant; the time allowed for cleaning is 10 minutes, and they are then tested for blockages. Needles and syringes are finally rinsed in plain and distilled water, the plungers in "pirn" boards and the pistons on trays, before being transferred to the drying cupboard (100° C.) Returned instruments and hardware are disinfected and washed in this room.

This room also had a built-in drying cupboard, the design and working of which proved unsatisfactory, so a free-standing electric drying cupboard has now been installed. This is used for drying syringes, needles, rubber, aluminium-foil containers, Winchesters, and all glass and metal ware, preparatory to assembly of packs.

2. Work Room

This room is fitted with benches, with drawers and kneehole spaces underneath and wall-attached cupboards above. The drawers and cupboards contain all the items required for assembling packs, which is done on the benches and also on stainless-steel trolleys. In this room packs for theatres and wards are assembled and wrapped. On the window bench the washed and dried syringes are assembled, the plungers being lubricated with silicone; needles are sharpened and fitted to the syringes, which are then placed in "venesta" aluminium containers and capped with "ideal" aluminium-foil caps, using a manifold capping machine to take containers of different sizes; caps of different colours are used to distinguish syringe capacity and needle gauge. The advantage of this type of cap is that it adheres to the container and cannot be replaced as issued: a replaced cap therefore indicates a used syringe, whether it has been used or not, and is regarded as unsterile.

3. Autoclave Room

Assembled packs and miscellaneous items for wards and theatres are filled into special stainless-steel baskets on low trolleys and transported to the autoclave room. This room has two steam-pressure sterilizers and two hot-air ovens, the former for sterilization of packs and the latter for sterilization of syringes. All four sterilizers are built flush with the wall and may be serviced from the rear through a door. Both steam sterilizers are high-vacuum, operating at 28–29.5 in. (71–75 cm.) Hg, and a sterilizing temperature of 273° F. (134° C.). They are fully automatic and can be altered if desired, to operate at a sterilizing temperature of 250° F. (121° C.). We use a temperature of 273° F. for five minutes both for packs and for gloves, with completely satisfactory results.

The cycle of changes during the sterilizing procedure is visible on temperature and pressure gauges and a coloured lighting system, and is recorded on a time–temperature chart. One sterilizer has a capacity of 60 cu. ft. (1.7 cu. m.) and an overall cycle of 20 minutes, and the other a capacity of 50 cu. ft. (1.4 cu. m.) and a cycle of 35 minutes. The longer cycle is due to a less powerful vacuum pump, which is being replaced by a more powerful one, reducing the time and producing a

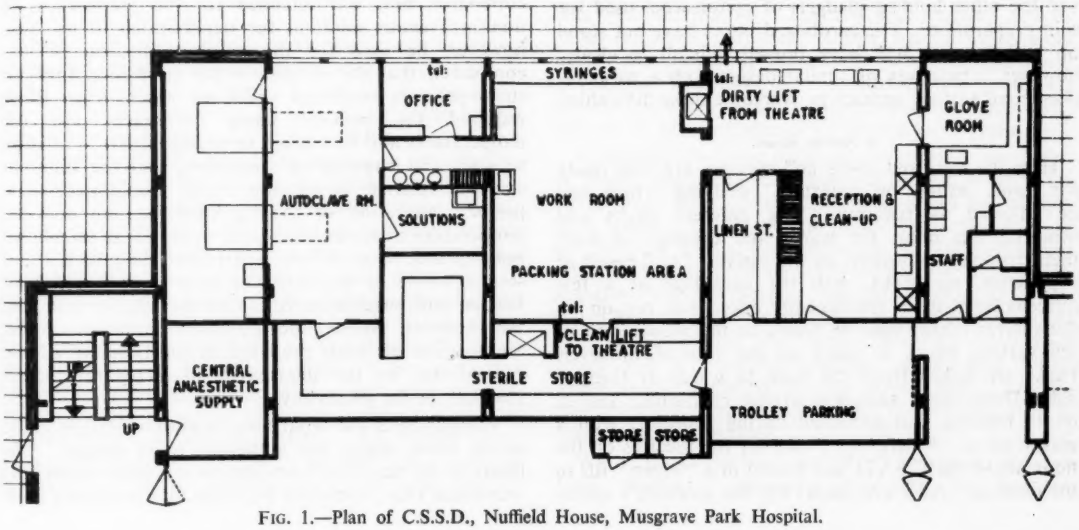


FIG. 1.—Plan of C.S.S.D., Nuffield House, Musgrave Park Hospital.

higher vacuum. The filled baskets are loaded into the sterilizers by two male orderlies. At the end of the cycle the chart is inspected by the sister-in-charge in order to check that the correct cycle has been followed. The sterilizer is then opened and the baskets are unloaded by the male orderlies, wearing asbestos gloves, and taken to the sterile store to cool. When cool the packs are placed in their designated positions on the shelves.

The hot-air ovens for sterilizing syringes are electric, are provided with fans and time–temperature recording charts, and are fully automatic. Each oven has a total capacity of 160 2-ml. syringes in four trays, with a smaller capacity if syringes of larger volume are being sterilized. The first cycle in the morning takes three hours, including maintenance of a temperature of 160° C. for one hour; succeeding cycles on the same day take two hours. The syringes in their sealed containers are issued in stout covered cardboard boxes (Fig. 2),

FIG. 2.—Cardboard carton of ward issue of sterile syringes. Contents: 18 2-ml. syringes; 5 5-ml. syringes; 3 10-ml. syringes; 3 20-ml. syringes; spare needles; monocup with foam-rubber sponge for used needles; monocup with swabs for skin preparation.

slotted to hold an adequate supply of syringes of different capacities for one day's use in each ward or theatre. Each box has also two unwaxed monocups, one containing a foam-rubber sponge to receive used needles and the other holding pledgets of cotton-wool used for skin preparation. The cardboard boxes have not stood up well to wear and have proved difficult to clean; however, a new box of similar design with a washable plasticized surface appears to overcome these difficulties.

4. Sterile Store

Here the sterilized packs and syringes are held ready for issue, stored on "dexion" shelving which can be adjusted as required. The different packs and miscellaneous items for wards and theatres all have their designated positions on the shelves. As a result of experience, no packs, with the exception of a few miscellaneous items infrequently asked for, remain on the shelves longer than 48 hours, as the preparation of the various packs is based on the rate of turnover. Packs are issued from the store to wards or theatres via a Dutch door against a written requisition, loaded on to trolleys, and protected during transport with a plastic cover. Emergency packs for the theatres on the floor above the C.S.S.D. are placed in a "clean" lift in the evening. At 8 a.m. packs for the morning's operations are placed in the lift against a written requisition. Arrangements have been made for emergency supplies during the night and off-duty hours.

Ancillary Rooms

There are also five ancillary rooms or areas.

(*a*) At the entrance to the C.S.S.D. is a *trolley bay* where trolleys are loaded, unloaded, or parked—the door for receiving and issue open directly into this bay.

(*b*) *Glove-processing room.*—This room was originally designed for needle-cleaning and sharpening and the maintenance of theatre instruments, gloves being processed in the receiving-room. It was found, however, that during the powdering of gloves, even by mechanical means, powder became dispersed into the air, and even into the barrels and on to the pistons of the syringes, causing them to stick. The processing of gloves was therefore transferred to this room, which is provided with a bench, a "bendix" washing-machine with water supply and waste for washing gloves, up to 40 pairs at a time, a thermostatically controlled automatic glove conditioner for drying gloves, 20 at a time for 15 minutes, and an automatic glove-powdering machine which powders a similar number of gloves in five minutes. The gloves are also examined and tested for tears or perforations, and patched or discarded—patched gloves are not supplied to the theatres. The gloves are then paired up and packed in cotton balloon cloth for sterilization. An extract fan is to be installed to remove dispersed powder.

(*c*) *Linen Store.*—This room is adjacent to the preparation room, and all linen (wraps, towels, gowns, etc.) required for packs is stored on "dexion" shelving; a bench in the store is used for folding linen, which is replenished as required from the hospital store.

(*d*) *Office.*—This is used by the sister-in-charge and is situated between the preparation and autoclave rooms. She is in telephonic communication with all parts of the hospital, and there is another telephone in the sterile store. Opposite the office is a large cupboard which contains three electric "manesty" stills for the supply of distilled water.

(*e*) *Solution Room.*—This is a small room off the autoclave room, provided with a bench, shelves, and cupboards, and was intended for the preparation of non-intravenous solutions for sterilization. It will not, however, be used for this purpose, because it was considered that the conditions for sterilizing fluids in steam-pressure sterilizers differ so much from those required for packs. These differences are the temperatures and time taken to sterilize fluids in relation to sizes and contents of containers, and the different cycle in relation to vacuum. This would necessitate periodic alteration of the automatic system and the temperature of sterilization, and would cause unjustified hold-up and waste of time, apart from the possibility of serious errors in the sterilizing techniques, bursting of bottles, and possible corrosion of the interior lining of the chamber, unless a non-corrosive lining was fitted. Sterilization of fluids prepared in the hospital will be carried out by the pharmacist in a separate steam sterilizer in the pharmacy.

Ventilation in the department is natural, except in the sterile store, which has a plenum input system. The floors of the receiving-room and the autoclave room have tessellated tiles; elsewhere linoleum tiles have been used.

Changing, washing, and toilet accommodation, adjacent to the unit, is also provided for the C.S.S.D. staff.

This unit is a prototype, and certain modifications have been made in the light of experience, and more are being made. Racks and shelves are therefore demountable, and benches, drawers, and cupboards can be altered.

Staff and Teaching

The present establishment consists of a sister-in-charge, a staff nurse, an assistant nurse, six female orderlies, and two male orderlies—a total of 11. This is adequate, and compares favourably with the establishment of 24 employed in the C.S.S.D. for a 600-bed hospital in Canada. Nurses in the preliminary training school are taught the traditional methods of sterilization and ward procedure and the new method of packs. Two student nurses at a time spend a fortnight of their training in the department working as observers but are not counted on the working strength. They are taught the contents of the packs, how to set them out, and their use, and take part in all procedures in the department. Bound volumes containing photographs of the layout of all packs, with details of their contents, are provided for teaching and demonstration.

Provision of Sterile Packs

This service provides, in a sterile condition, a convenient and appropriate assortment of instruments and dressings in packs of each of the standard operations or procedures in the theatres and wards. Over a period of about four years the technical sub-committee has developed a series of standardized packs —a considerable undertaking when one considers the various items required for different operations, ward procedures, and the special demands of different surgeons and anaesthetists. All drums, Cheatle forceps, and all of 22 boiling-water sterilizers in use in the hospital have been discarded—representing a considerable saving on maintenance and replacement, as well as being a contribution to the prevention of infection.

Theatre Packs

Theatre packs are divided into five categories: general, orthopaedic, gynaecological, gynaecological (minor), and thoracic.

There are three basic packs for each category, designated major, intermediate, and minor. There are, in addition, supplementary packs, usually containing only a few items, which are added to a basic pack in order to give the correct assortment for any procedure, or to meet the requirements of a particular surgeon or anaesthetist. For the theatres 40 basic and supplementary packs are available. Theatre packs contain gowns, towels, gloves, masks, paper hand-towels; special packs include items such as basins, kidney bowls, gallipots, and dressings. The packs are wrapped in an inner layer of green balloon cloth and an outer layer of double balloon cloth. They are packed in such a way that they can be opened by the instrument nurse if necessary before she scrubs-up or by her assistant. The packs are secured by grass-tape, and a strip of adhesive pressure-sensitive tape on which are written the date and an identification code of the contents. All theatre packs are assembled and supervised by the staff nurse or sister-in-charge. Tests for sterility are carried out regularly by the insertion of Browne's tubes and *Bacillus stearothermophilus* spores into the centre of packs. Mackintosh sheets or jaconet are no longer used, because over 200 bacteriological tests showed that spores placed in the folds survived the sterilization cycle in 45% of the tests. Huckaback towelling has replaced mackintosh and jaconet.

Ward Packs

Ward packs are sterilized and divided into three categories: those for (1) "sterile" and (2) "clean" procedures, and (3) miscellaneous. Packs for "sterile" procedures have a double covering of white balloon cloth; those for "clean" procedures are wrapped in white crêpe paper—this requires some explanation. The use of balloon cloth for wrapping packs raised a problem of laundry costs, which were high. To overcome this it was decided to try paper. Numerous tests were carried out using different types of paper as wraps; kraft paper and some other papers burst or tore too easily after sterilization. A crêpe paper now in use is very satisfactory, but it does not drape readily for use on trolleys. However, a new embossed paper has recently been received, and on preliminary trials appears to be the answer.

Many dozens of tests have been carried out to estimate how long packs wrapped in a double layer of crêpe paper would remain sterile under different conditions. The method of Howie and Timbury (1956) was used, a gauze swab being placed immediately under the outer paper wrap on all six sides of the pack, together with a gauze swab, Browne's tubes, and *B. stearothermophilus* spores in the centre of the pack. Packs were prepared, sterilized, and placed on the store shelves for periods from one to eight weeks before being sent at the rate of one pack per week to the laboratory for test. Similar packs were also stored for one week, then sent to each of four wards, where they were kept till required for use, but instead of being used they were returned to the C.S.S.D. unopened for transmission to the laboratory. The results showed that packs kept in the sterile store would remain sterile for at least four weeks, and probably longer. The three packs, from each of which one unsterile swab was obtained after storage for five, seven, and eight weeks, yielded organisms—*Staphylococcus albus* and an aerobic sporing bacillus—which were present in the air of the laboratory in which the tests were carried out. This test was repeated and all packs remained sterile on aerobic culture up to eight weeks, the length of the experiment. All the packs stored, sent to the wards, and returned unopened were sterile. In every instance Browne's tubes were green and the *B. stearothermophilus* spores were killed.

A control set of four packs was wrapped in two layers of gauze, sterilized, and placed in the sterile store for one to four weeks, one pack being tested for sterility each week. All six swabs under the wrap of each of the four packs were unsterile, the contaminating organisms being predominantly *Staph. albus* coagulase-negative, with an aerobic sporing bacillus in a few instances, and a fungus on one swab. In each pack the swab in the centre was sterile, Browne's tubes were green, and *B. stearothermophilus* spores were killed. These results satisfied us that paper was a suitable medium for wrapping packs, from the point of view of maintenance of sterility.

Ward packs include complete dressings, separate small dressings, catheters, and sets for drainage,

irrigation, aspiration, intravenous cut-down (Fig. 3), as well as instruments, bowls, gallipots, and mouth trays. Over 70 different packs are supplied to the wards, including 22 for "sterile" procedures, 21 for "clean" procedures, and more than 30 miscellaneous items such as catheters, tubes, scissors, forceps, clips, gauze, and gamgee.

Examination of Services

The work of the unit has been kept under continuous review since it opened two years ago, and a work-study investigation has been carried out during the last six months, to assess the extent to which the service meets the demand of the hospital, to see what improvements could be made or introduced in trial form, and to study the cost of the service. Records (Fig. 4) have been kept of all issues of packs and syringes since the inception of the service.

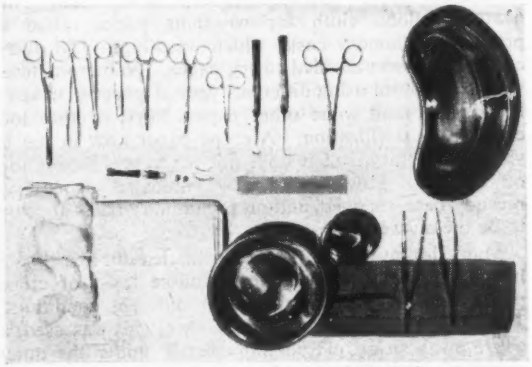


FIG. 3.—Intravenous cut-down pack ready for use.

Packs

Modifications to methods have been recommended and many have already been introduced, while others are planned. The main modifications are:

1. Because of early losses, scissors are issued as a separate pack and signed for by the ward orderly.

2. Drawers and cupboards contained an assortment of different items, which caused extra work in sorting and identification; because of this and the narrowness of benches when making up large packs, a new prototype packing station was assembled and put into use. The use of this new packing station has resulted in a considerable reduction in work content. It is therefore proposed to remove the existing benches, drawers, and wall cupboards used for making packs, and install three new packing stations (Fig. 5), two for ward packs and one for theatre packs, when an even greater reduction in work content is expected.* There will also be a bench for linen-folding and a stillage for autoclave baskets. The main principle involved in this replanning is that all supplies should be within arm's length.

3. Improved planning of trolley arrivals from wards to avoid overcrowding has been put into operation.

4. Returned articles from packs are now checked and collected at ward level instead of at the C.S.S.D.

5. The ward requisition list has been replanned to simplify data on issues and returns.

6. Improvements are planned for the methods of loading and unloading one of the two sterilizers.

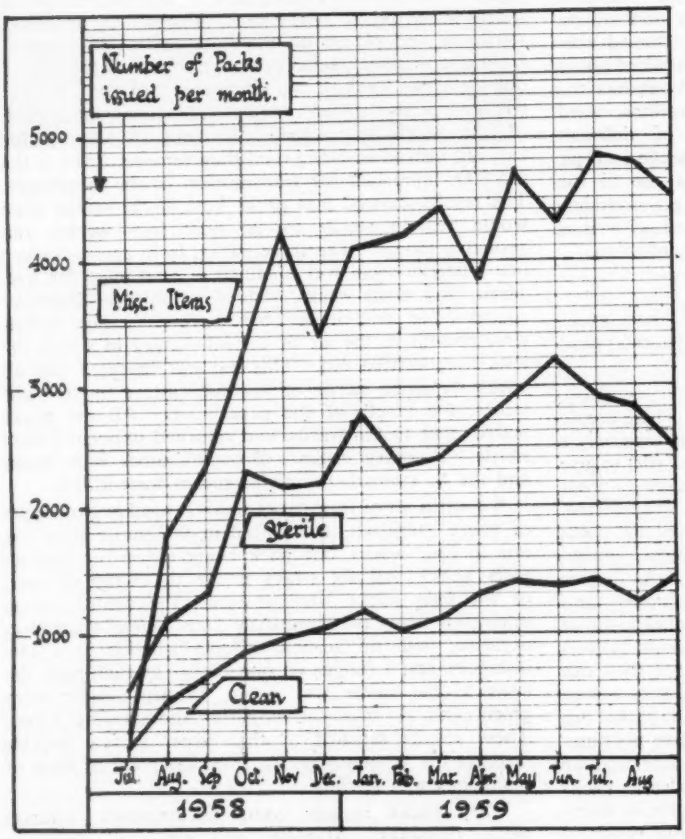


FIG. 4.—Monthly issues of ward packs.

The average labour cost per bed/day for ward packs has been estimated at 1.48d., and the average labour cost of theatre packs at 54d. per operation. Laundry costs are extra—about 15s. for packs for a major operation. Both of the labour costs are expected to be reduced when modifications have been made.

Syringes

The syringes used are glass with metal nozzle, interchangeable, with capacities of 2, 5, 10, and 20 ml. (tuberculin and insulin syringes are available if required). The present syringe usage is about 400 per day, of which 80% are of 2-ml. capacity, the remainder being fairly evenly divided. The total number of syringes originally supplied was based on three times the daily issue divided among the estimated capacities required plus 25% to cover emergencies and week-ends, when work ceased in the unit—this estimate has proved correct. After discussions with medical and nursing staff it was agreed that the sizes of needles supplied should be reduced from 14 to 5. The average life of a syringe supplied from the C.S.S.D. has been estimated at 135 usages; replacements average 15.5 per week, and breakages are less than 1% of the stock per week. Needles show an average of 36.6 usages before being discarded; replacements average 51.5 per week, and

*These alterations have now been made and an improved free-standing double packing station for ward packs has been installed.

only 12.5% of used needles are returned blunted. The hospital pharmacist, who supplies needles to the C.S.S.D., has stated that the present system uses fewer new needles per week for the whole hospital than was formerly used by one ward in a week. Syringe breakages appear to be nearly always where the metal butt is joined to the glass nozzle.

Recommendations for modification of methods include (1) improved apparatus for testing for needle blockage, (2) inquiry into the possibility of an automatic sharpening process, and (3) foot or power operation of the capping machine. The labour and replacement cost per syringe issued has been estimated at 3.29d., and implementation of certain of the recommendations is expected to reduce the cost to 2.95d. The addition of maintenance and services costs is estimated to bring the total cost per syringe up to about 4d. Disposable syringes and needles are at present on trial in this country at an estimated cost of approximately 5d. per syringe and 2d. per needle—a total of 7d. for 2-ml. syringes, rising to 14d. for 5-ml. and 18d. for 10-ml. syringes. Although the principle of a disposable syringe is an attractive one, comparison of current relative costs suggests that it is more expensive than the present system. Moreover, the hot-air ovens are far from working to full capacity, and consideration is to be given to extension of the syringe service to another large hospital, which should further reduce costs.

Gloves

Glove issues per week are of the order of 300 pairs, and on an average each glove is issued five times—evidence that the sterilization cycle with a temperature of 273° F. (134° C.) has no deleterious effect. A series of tests to check glove life, in which the gloves were sterilized, worn, removed, washed, dried, powdered, tested, turned, and repacked, showed that the gloves regularly burst at the sixth cycle. This suggests that gloves should perhaps not be reissued for theatre use more than four times, to allow for an adequate margin of safety. The total cost of labour and replacement of gloves per pair issued has been estimated at 10.4d., exclusive of laundry costs for the pack cover.

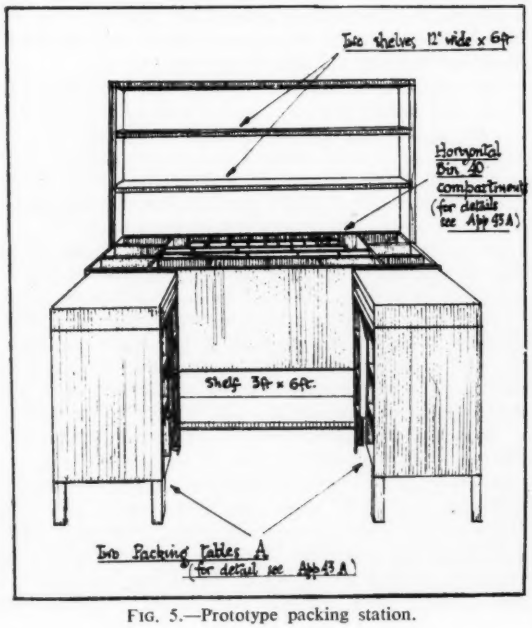

Two shelves, 12" wide x 6ft
Horizontal Bin, 20 compartments (for details see App 43A)
Shelf 3ft x 6ft.
Two Packing Tables A (for detail see App 43A)

FIG. 5.—Prototype packing station.

Linen

The C.S.S.D. must ensure that the linen is sound, and free from tears or holes, and carry out correct folding. This is work which might be done by a trained worker in the hospital laundry; but at this hospital most of the laundry is at present sent to a commercial establishment. These difficulties will largely be overcome by the provision of a linen-folding table in the work room.

Equipment

The results of the work-study investigation indicate that (1) although eight sinks are installed, four would be adequate for current needs; (2) three benches, instead of the six installed, would suffice; (3) whereas eight packing stations are available, three would be adequate—two for ward packs and one for theatre packs; (4) the washing machine for gloves could cope with double the present demand; and (5) the glove-drying and glove-powdering machines could deal with four times the present turnover.

The total capacity of the steam sterilizers has for some time been recognized to be too great, and it has been estimated that one-half the present capacity would be adequate. It has, however, to be remembered, in extenuation, that this was a pioneer project in this country, that automatic, high-vacuum, high-temperature steam-pressure sterilizers had not hitherto been used, and that one of the sterilizers was a prototype. The greatly shortened sterilization cycle was also a circumstance which contributed to a larger turnover of sterilized packs, and at the time the numbers and sizes of packs were an unknown factor. Teething troubles have been experienced with both sterilizers, but these are gradually being overcome.

The electric hot-air ovens at present sterilize about 400 syringes per day, but if used to full capacity it is estimated that they could deal with 1,200. On the other hand, allowances must be made in the case both of the steam sterilizers and of the hot-air ovens for time spent in maintenance and curing breakdowns, which do occur, so the margin of excess needs must not be too narrow.

Increasing use is being made of disposable items, such as paper towels, paper for covering certain packs, aluminium-foil utensils, and catheters. All instruments, Cheatle forceps, and sterilizers have been removed from wards and departments, and no drums are used. Cardboard containers were considered as an alternative to fabric for packs, but for various reasons the consensus of opinion did not favour them. Such containers may have a place where packs are to be transported to hospitals in a group, although even here paper or "polythene" bags sealed with adhesive tape may be used as an additional protection against contamination. These are at present used for some packs which are in infrequent demand and for packs sent to the laboratory for sterility tests.

Conclusions

A C.S.S.D. may be one of two types: (1) that serving only the hospital in which it is situated, and (2) that serving a number of hospitals in a group within a radius of a few miles. The latter involves cost of transport, additional labour, and specially designed containers for distribution of packs within the hospitals. On the other hand, the C.S.S.D. serving its own hospital alone involves

accommodation, equipment, and staff at each hospital, and the comparative economics and personal service of the two schemes have not yet been assessed.

The scheme under consideration services only its own hospital, and there is no doubt that it is fulfilling the original principles for which it was designed. In the early stages there was a certain amount of doubt among both the nursing and the medical staff about its value and increased efficiency, but this has now been proved, and the staff would not consider reverting to former procedures. The time taken to do ward dressings has been reduced by nearly 50%, and the time taken to prepare trolleys between operations has been reduced from 10 to 5 minutes. The surgeons and theatre staff have co-operated fully and are well satisfied with the service provided. Infection records to date indicate a reduction in secondary infection of surgical wounds, but a two-year study at present under way will be necessary before definite conclusions can be arrived at. So far the total sepsis rate has been estimated at 3%.

In the work-study investigation of the department and its functions the salient points noted were: oversupply of equipment, excess demand for packs and gloves (to be controlled by keeping regular records of issues and returns), and the need for improvement of methods in the department by reorganization of storage facilities, packing surfaces, and sterilizer loading. The department is dynamic, and new materials and methods have been on trial since the department opened.

As regards staffing and control of the department, the appointment of a qualified and experienced member of the nursing staff as the officer-in-charge has proved an unqualified success. Only a trained nurse can discuss at a technical level with ward and theatre sisters and surgeons the problems which constantly demand attention; administrative ability and considerable tact are very necessary. Regular inspection and maintenance of equipment, especially sterilizers, should be carried out by the hospital engineer at not less than fortnightly intervals, as a preventive rather than a curative measure. Failure of sterilizers or hot-air ovens could seriously upset the work of the hospital, and for this reason there should be at least two steam-pressure sterilizers and two hot-air ovens. The consultant bacteriologist should play an important part in the maintenance and control of sterility and act in an advisory capacity, and also be conversant with the working of the sterilizers.

Thanks are due to the many people who have co-operated in the setting up of this department, especially the Nuffield Foundation and the Northern Ireland Hospitals Authority. Dr. Darmady has given helpful advice on syringe processing, and the Bowater-Scott Corporation Ltd. has kindly supplied many types of paper for trial. I am also indebted to the sister in charge of the department for much detailed information and co-operation in numerous laboratory tests.

REFERENCES

Howie, J. W., and Timbury, M. C. (1956). *Lancet*, **2**, 669.
Nuffield Provincial Hospitals Trust (1958). "Present Sterilizing Practice in Six Hospitals."

NEW AMERICAN MEDICAL SCHOOLS

BY

JOHN D. SPILLANE, M.D., F.R.C.P.
Consultant Neurologist, Cardiff Royal Infirmary

To visit one of the new American university medical centres is to enter a world which is certainly not English. The language is spoken there, it is true, but much else is vastly different. It is not merely the scale of things, the display of wealth, the bold designs in shimmering glass and aluminium, nor the light and colour of the airy lounges with their murals and bright furnishings. Other things impress more. The entrance to the staff car park is by a gate which the driver opens by leaning out of his car and slipping a card into a slot in a post. In Los Angeles a medical student may drive in 40 miles at 6 a.m. to get a parking-place. Later that day you may see him in the psychiatry department watching an interview through "one-way" glass, listening to patient and doctor through earphones. Or you may meet him in the physiology laboratory performing a classical experiment with the aid of television.

In the wards you may see a patient selecting his meals from a printed and dated menu card or adjusting his electrically operated "high-low" bed or conversing on the bedside "intercomm" with a nurse at her station down the corridor. Like a captain on his bridge, she, with her aides, is in touch with all decks. She has her control panel with its switches and buttons, paging and signal systems, telephones, automatic conveyer, and pneumatic tubes, and, to port or starboard, her "floor manager" or "ward clerk." In the nursery, television helps the staff to keep a watch on a clutch of babies. In the ambulant wing a two-bed hotel-type room contains man and wife; only one is a patient. In a four-room apartment at the end of a ward floor the family of a disabled patient are taught "home-care." In a laboratory a technician adjusts his auto-analyser (40 blood sugars or ureas in an hour) or his red and white blood cell counter (12 seconds per count).

The physician administrator, who has worked everywhere and knows everyone, says, "Cancer? We'll lick it. It's only a question of dollars!" The matron, on the subject of married medical students (70% of the final year), says, "Why, there are a dozen here who would marry me to-morrow—if I'd put them through college!" The dean in his office (interrupted by a telephone call from a student's wife asking if he would mind telling Joe to pick up a rye loaf on the way home; yes, it happened!) invites you to sit in on to-morrow's interview session for student entry, "You can read their dossiers to-night." (There will be 12 faculty members, 24 applicants, two student observers, and it will last all day, including a "getting-to-know-you" lunch with one doctor and two aspirants at each table.) To-morrow is a Saturday, and interviewing will be repeated every Saturday for ten weeks. And so on.

There are now 85 medical schools in the United States, and, although 12 of these have been started since the last war, there are still nine States without one. It is estimated that a further 15 or so new schools will be required in the next 15 years. In at least 22 places in the country new schools are under consideration

(Willard, 1960). Nine of the 12 new schools are new institutions; the Albert Einstein College of Medicine, in the Bronx, New York; the Downstate Medical Center, Brooklyn, New York; the University of Washington, Seattle; Stanford University, Palo Alto, California; the University of California at Los Angeles; the University of Miami, Florida; the University of Florida, Gainesville; the University of Kentucky, Lexington; and Seton Hall College of Medicine, New Jersey. I visited six of them in 1959, and a brief account of three of them may be of some topical interest.

University of Washington, Seattle

Seattle, in the north-west corner of the State of Washington, enjoys incomparable views of mountains and water. The University of Washington is a State-owned institution in the residential north end of the city on a fine, sloping campus overlooking Portage Bay (Fig. 1). The student population is about 15,000. Medical and Dental Schools were founded in 1945, when the State legislature established the "Health Sciences Division" of the University to include the existing departments of pharmacy and nursing. It was planned to erect these four schools and teaching hospital in one building on the water's edge of the main university campus. By 1948 the Health Sciences Building, housing the School of Nursing, the School of Dentistry, the Basic Sciences Division, the library, and the auditorium was completed. In 1955, on the east end of the Health Sciences Building, Unit 1 of the teaching hospital was completed. It is the hospital's west wing, and is referred to as the "Research Wing." In September, 1959, the second unit of the hospital was opened. The whole project will be completed when the school of pharmacy, which is still situated on the main campus, is built on to the west end of the Health Sciences Building.

The University Hospital is owned by the University of Washington and governed by its Board of Regents. The hospital administrator is responsible to the Dean of the School of Medicine (Dr. George N. Aagaard), who is responsible to the University President. Seventy-five students are admitted annually to the School of Medicine. At present the teaching hospital contains 300 beds and there are clinics for about 75,000 out-patient visits annually. Clinical teaching facilities are also available at King County Hospital, Veterans' Administration Hospital, Children's Orthopaedic Hospital, and others.

In planning the hospital the authorities wished it to be "truly patient-centred." "Departmental locations and functional relationships were established which would create the atmosphere and working conditions most conducive to the highest quality of patient care." There is a single standard for patient care, and no private accommodation. Patients must be referred in writing by a doctor, and admission implies that they illustrate problems of teaching value. All patients are used in the teaching programme. As in all modern American hospitals, it is hoped that by installing the most modern equipment there will be a considerable saving in operating costs. "The lowest guy on the totem pole here," I was told, "earns $200 a month; we just cannot afford to have 'em around." There are automatic pneumatic tubes, remote control dictation, conveyers, intercommunication, nurses' call, paging and signal systems; central supply systems, piped oxygen, piped suction, and post-operative recovery rooms; and facilities for television have also been provided. The general design of the hospital will permit later expansion of services on the first and second floors laterally and ward units vertically.

Each hospital floor is in the shape of a cross with a central core containing public and service lifts, the nursing supervisor's office, class-rooms, and students' room and laboratories (Fig. 2). In the west wing of each floor are the offices, laboratories, and teaching-rooms for the departments in charge of that clinical floor. The north, south, and east wings contain the ward units, designed on the double corridor system with the nurse's station at the entrance to each unit (30 beds), central ancillary services, and with bedrooms (for one, two, and four patients) on each side.

Stanford University, Palo Alto, California

The first medical school on the Pacific coast of North America was opened in 1859 in San Francisco. It was called Cooper Medical College after its founder, Dr. Samuel Elias Cooper. In 1908 Stanford University, in Palo Alto, 30 miles south of San Francisco, accepted Cooper Medical College as one of its faculties. Until 1959 and the opening of the New Stanford Medical

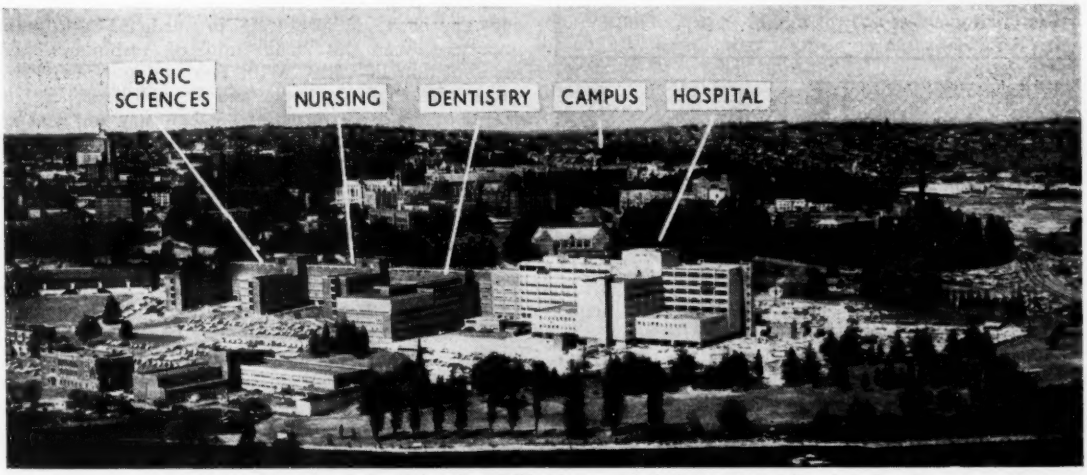


FIG. 1.—Aerial view of the University of Washington Medical School and Hospital, Seattle

Centre at Palo Alto, medical students received their preclinical training on the Stanford campus and their clinical training in Stanford Lane Hospital in San Francisco. The Centre is a huge H-shaped, three-story structure 40 feet (12 metres) in height. It really consists of seven buildings—three hospital and four medical school—all under one roof. The centre was designed with a garden-like atmosphere around pools, fountains, trees, flower-beds, and open courtyards and patios.

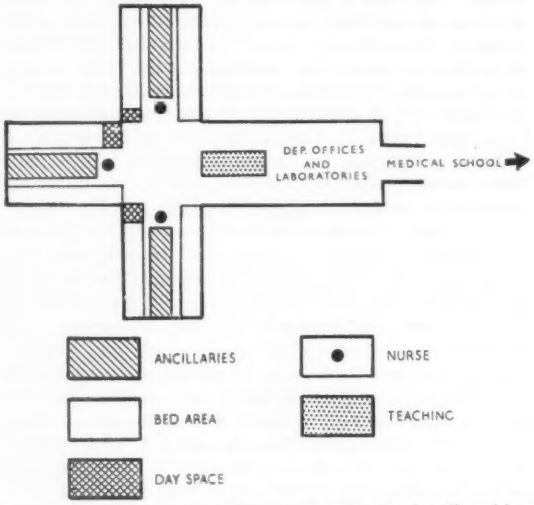


FIG. 2.—Diagram of a ward floor at Seattle, showing disposition of main elements.

Precast concrete grill-work is used to screen the various open spaces of the buildings, and the whole effect in the Californian setting is unforgettable.

The hospital consists of two wings joined by a central core which contains both medical and service facilities. There are 440 beds, distributed in three floors of each wing. Each wing has a double corridor system with about 68 beds to each floor (20 rooms of two beds, 4 with five beds, 8 single rooms). On each floor there are two centrally placed nursing stations with a solarium and patients' lounge at one end, and a visitors' lounge at the other (Fig. 3). Within the central core of the

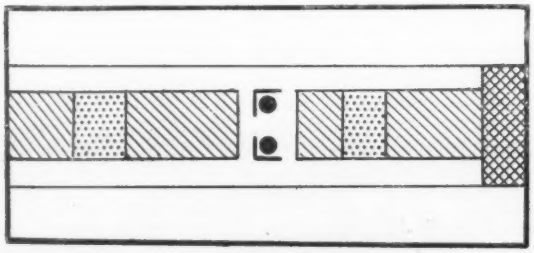


FIG. 3.—Diagram of a ward floor at Stanford, showing disposition of main elements.

hospital, medical and service facilities are situated. Connecting the hospital with the medical school is the large Boswell Building, which houses the out-patient departments, radiotherapy, biophysics, and various research laboratories. The medical school is made up of four buildings, each with its own courtyard. A rough idea of the layout in the three stories of these buildings is given in Fig. 4.

Some 60 medical students are admitted annually. Adjacent Veterans' Administration Hospitals will provide further teaching material. It is estimated that approximately 100,000 visits annually will be made to the out-patient clinics. A new curriculum has been designed (Stowe, 1959). It is based on a five-year course which students enter after three or four college years. In the first three years an amount of time (designated "University Time") equivalent to one academic year

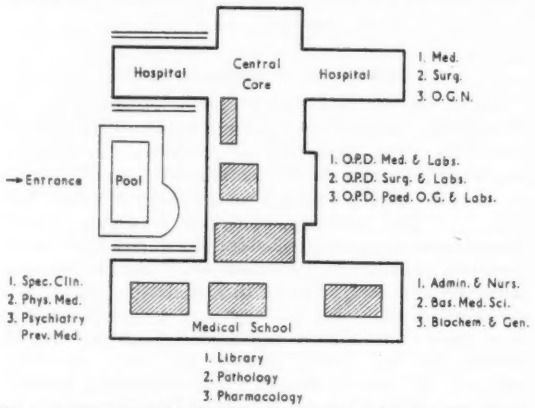


FIG. 4.—Stanford Medical Centre. An H-shaped complex of buildings comprising the medical school and hospital. It is built around a series of courtyards, in three stories. To show general location of main departments.

may be devoted to work in any department of the University. Simultaneously the student begins the study of the basic medical sciences. He is also gradually introduced to clinical problems. The fourth and fifth years are devoted to a series of interdepartmental courses. There is a large amount of free time throughout the curriculum, and in the final year it amounts to a full third of the year's activity. "Integration" is not an end in itself at Stanford; it "contains as many defects as it does advantages and provokes vigorous resistance." Nevertheless, the thoughts that have guided the Stanford staff in preparing the new curriculum have been that (1) education is a continuum: preclinical and clinical work must be brought closer together; (2) there is a core of medical knowledge which should be presented to all students; and (3) the medical student is essentially a graduate student, and his attitude towards, and approach to, problems in medicine are more important than his acquisition of techniques and accumulation of data. With two young Nobel Prize winners (Arthur Kornberg and Joshua Lederberg) in charge of the departments of biochemistry and genetics in this new medical school, Californians can justifiably expect that the £7,500,000 spent in construction and equipment, and the bold plans of the staff, will bring their rewards.

University of Florida, Gainesville

In 1949 the Florida State legislature authorized the University of Florida, Gainesville, to establish a medical and dental school on the campus. The Medical School was opened in 1956, the Teaching Hospital in 1958, and the first class will graduate in 1960. In a series of volumes published by the University of Florida Press (1954–5), a study group reported extensively on the needs and resources of the State in the health field. The dean of the school, Dr. George T. Harrell (1956,

1957, 1958), has described the ideas and aims behind the curriculum and the construction of the school and hospital.

Sociological surveys in Florida revealed that the population was rapidly expanding and an increasing number of old people were moving into the State. The major aim of the school is the training of family physicians for practice in the State : the tradition of the family physician is stronger in the South than in the North. The declining number of applicants to medical schools all over the United States means that the university has a responsibility to determine if new types of personnel will be needed to help the physician. It is felt that the field of patient-care should be broadened, and it is for this reason that the unit at Gainesville has been called a "Health Centre" rather than a "medical centre." Undergraduate students at the end of two years in college are advised how to begin pre-professional training, and the role and point of view of the various professions are made clear to them. Members of the medical faculty are now teaching in selected pre-professional courses in the college. Basic biological principles such as variability and adaptability are used to introduce the theme of human biology, which is continued throughout the medical course (Fig. 5). It is felt that the social and behavioural points of view must have some expression in the modern health centre.

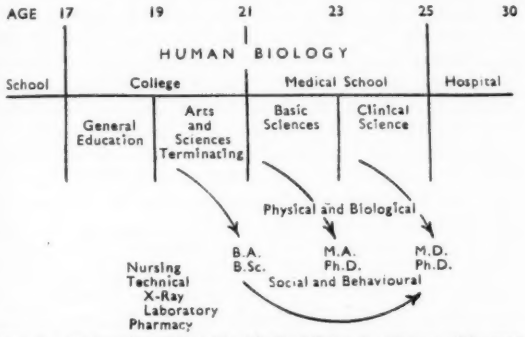
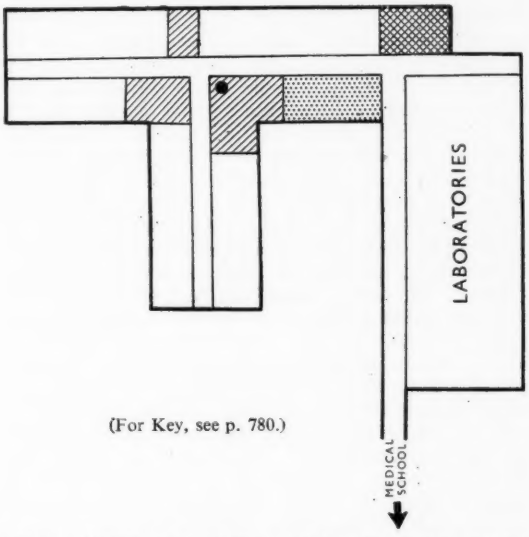


FIG. 5.—University of Florida Medical School. Theme of human biology that runs through university programme (Harrell, 1956).

The Medical Sciences Building of six stories is connected by a cross-wing to the eight-story teaching hospital (Fig. 6). Those clinical and basic sciences departments which have a common interest are placed on the same floor. They share teaching laboratories, lecture rooms, and facilities in the cross-wing. The hospital is a T-shaped structure with the main general departments on the first three floors and the clinical departments above. On the latter the teaching and service areas are located at the centre of the "T" (Fig. 7). On each ward floor there is a four-room apartment with living-room, kitchen, bedroom, and bath, where patients and their families can be instructed in methods of "home-care," the use of items of equipment, and the preparation of diets. Similar facilities are provided in the out-patient departments. There is an ambulant wing on the third floor consisting of 26 motel-type rooms, each for two persons for whom bedside food and nursing services are not necessary. Medical care in this wing is administratively related to the out-patient department.



(For Key, see p. 780.)

FIG. 7.—Diagram of a ward floor at Gainesville, Florida, showing disposition of main elements.

Each student is assigned to a "study-desk" on entering medical school. He retains this for two years, and on moving to the hospital is provided with another unit. The idea is that such an arrangement should help the student to capture the flavour of the practising physician's desk and to bring home to him that, "somewhere, sometime each day for the rest of his professional life he must think about what he has done and put it in perspective with what he knows." For the first two years he will collect his data from the basic sciences departments and the second two years he will collect them from patients. It is hoped that the importance of the essential educational process of synthesizing his knowledge will be dramatized for the student in this way.

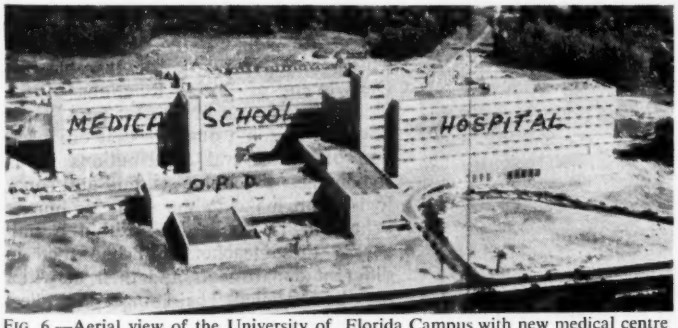


FIG. 6.—Aerial view of the University of Florida Campus with new medical centre in foreground.

Teaching Trends

It is not easy to say anything fresh about the education of the American doctor. His teachers seem more dissatisfied than ours and their struggles with their consciences more tormenting. (Why is it that, on both sides of the Atlantic, surgeons are in a happier position ? Because they have said less ?) The whole

subject is awash with solemn nonsense, but in America it is the jargon that bewilders and antagonizes. One tires of "motivation," "challenge," "goals," "skills," "aptitudes," and "drives" ("serendipity" is the latest), but it is only fair to say that so do many American teachers.

Not wishing to add to the folklore of medical education, I shall only mention and comment on a few trends.

"Integration" (pax to the Old Guard!) in the curriculum, about which there has been much hue and cry in the 'fifties, is a topic which still arouses both cynicism and fanaticism. But I found that the majority of teachers appreciated that it is not an end in itself and that structural facilities do not guarantee it. Neither do conferences and seminars and symposia. Many facts seem to defy integration. The derogation of the old-fashioned lecture has gone too far. Poorly done we know it has little educational value, but the same can be said for the small-group discussion and the laboratory exercise. The lecture indeed can be a good way of providing perspective. And is not the necropsy room a good integrator? The weekly clinico-pathological conference at the Massuchusetts General Hospital was described by one speaker there as "the last remaining honest quiz-programme in the United States." Walter Bauer (1959) believes "it is the general medical ward that is the basic area of integration." But few will deny that, if in the past 15 years a medical school has not got down to a course-by-course analysis of its curriculum, the scope for integration in that school remains wide. At Harvard the committee which rearranged the curriculum of the preclinical years advocated "the active co-operation of strong departments. The interplay of different approaches was felt to be more desirable than the loss of identity of the various disciplines" (Karnovsky, 1957). From Yale we hear that "these devices cannot be imposed by the administration, but if the atmosphere is favourable they can be encouraged to grow and flourish" (Lippard, 1955). Good teaching will be found wherever there are good teachers, irrespective of facilities, methods, and curricula. Some take refuge in that knowledge. But next to teachers these things are important, and in assessing their value we need not be artless or naive about the new, nor should we be mesmerized by the past.

The multi-discipline teaching laboratories, pioneered at Western Reserve, are a success. They have done away with the wastefulness of semi-vacant, single-purpose laboratories, the duplication of facilities and staff, and the endless flow of students. They encourage interdepartmental teaching and they help to emphasize subject relationships. In some centres they are designed to provide a "home-base" for the student in his pre-clinical years. With the exception of gross anatomy all the work of the basic sciences departments can be done in them. At Gainesville four student groups (64 students) may be taught at one time, or each of the laboratories may be divided by movable partitions into two, three, or four units (Fig. 8). "Sit-down" and "stand-up" types of laboratories are provided on alternate floors. At Stanford each unit is planned for 16 students, and connecting each pair of student laboratories is a central room used for demonstration, or for experiments on human subjects, and for the accommodation of jointly used major pieces of equipment. At the Albert Einstein College of Medicine, New York, completed in the spring of 1959, but yet without its new teaching hospital, student "office-laboratories" have also been provided. Each houses eight students where they pursue the major portion of their studies for the first two years. Here the student can keep his books and microscope and work at any hour he pleases. Teaching in these new laboratories is done autonomously and conjointly by the departments concerned. Standard "cookbook" experiments are being replaced by more imaginative exercises. The lavish provision of small conference and demonstration rooms in school and hospital fosters small-group, seminar methods of teaching. In Britain advocates of these methods rarely possess adequate facilities. The picturesque but forlorn scene of a group of students with their teacher stuck in some corner of a noisy lobby or corridor, in a lift bay or alcove, or on a draughty staircase is one with which we have been too long familiar in our teaching hospitals.

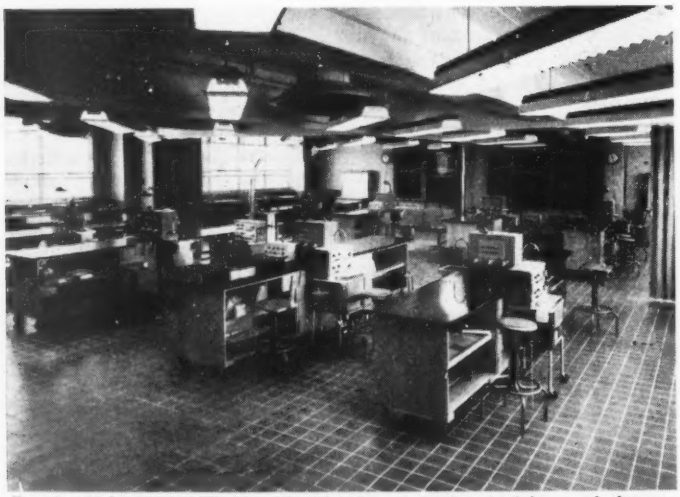


FIG. 8.—University of Florida. Teaching laboratory for physiology and pharmacology. Note folding partitions.

Departments of Behavioural Science

Another trend in the new American schools is in the establishment of departments of behavioural science. Human behaviour is becoming one of the basic essential subjects of the medical curriculum. The term "behavioural science" refers primarily to sociology, cultural anthropology, and social and experimental psychology. For some years courses on "growth and development" (including consideration of genetics, statistics, embryology, somatic and psychic development from infancy through adolescence) have been established in many schools. These are collaborative enterprises in which, as at Harvard, for example, the Department of Social Relations of the University plays a prominent part. It is now felt in some quarters that organization of the several contributions which sociologists, psychologists, and anthropologists can make to the study of human behaviour is required. Within a university these teachers will be found in different departments and their activities may be restricted. Their impact on medical education is limited if their work is

entirely within departments such as those of public health, preventive medicine, and psychiatry. In the new University of Kentucky Medical Centre, at Lexington, a formal department of behavioural science is being established with a medical sociologist (Robert Strauss) at its head. He explained to me that such a department would not have as its object the organization of yet another course. It would contribute to the basic sciences curriculum in a way calculated to demonstrate the relation of behaviour (psychological, social, and environmental) to the natural course of disease (genesis, diagnosis, course, and management). The health needs of society and the understanding of relationships will also be featured. It seemed to me that this broad approach would have more to offer than a course of lectures in normal psychology which British medical students desire (B.M.S.A., 1960).

Closed-circuit Television

The new schools are usually equipped for closed-circuit television, but its potentialities as a teaching instrument have not been widely studied. Many are sceptical of its value, but one feels that the poor reputation of commercial television in the U.S.A. may prejudice judgment. Practical experience will probably await the arrival of cheaper and smaller pieces of equipment, but these are on their way. With hand cameras no larger than a heavy revolver the possibilities are immense. We may soon be seeing on the screen enlarged pictures of the ear-drum and optic fundus, the interiors of such organs as the stomach, the urinary bladder, and the lung.

In Baylor University, Houston, Texas, television is in use as a teaching instrument. In the dental school there are two television studios, one equipped for

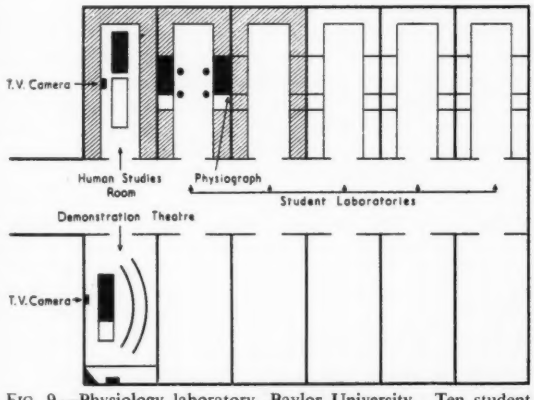


FIG. 9.—Physiology laboratory, Baylor University. Ten student rooms with physiograph stations, a demonstration theatre, and a human studies room.

clinical teaching and one for laboratory teaching, with monitors in all the unit laboratories (four students in each). More interesting, however, was the television set-up in a new laboratory of the department of physiology under the direction of H. E. Hoff, a former Rhodes Scholar at Oxford University. Here, as in many other schools, the smoked-drum kymograph has been replaced by the "physiograph," an instrument containing pick-ups, amplifiers, and a pen and moving-paper recording system which enables a wide spectrum of physiological events to be simultaneously recorded. The paper speed can be varied to permit the taking of standard electrocardiograms or electroencephalograms, or the recording of slow peristaltic waves or very gradual changes in blood-pressure. Professor Hoff has found that the modern generation of American students take to such instruments with surprising ease. The new physiology laboratory comprises 10 student laboratories with operating desks and physiographs, a human studies room with couch and physiograph, and a demonstration theatre equipped with an animal operating-table, physiograph, and raised seats and blackboard (Fig. 9). Both the latter two rooms contain television cameras. Each pair of students has a television screen and intercommunication system at the physiograph station. Broadcast demonstrations are used to exhibit experiments on animals and man which, because of expense, complicated apparatus, or difficult surgery, cannot readily be made available to small groups of students. An excellent "over-the-shoulder" view of an experiment can be transmitted, and the two-way conversations between student and teacher can be heard at all stations.

"Progressive Patient Care"

You cannot travel far in the United States hospital world nowadays before hearing the phrase "progressive patient care" (P.P.C.). It is a concept which has aroused considerable interest and is in operation at Stanford and Gainesville. The United States Public Health Service (U.S.P.H.S.) has published in 1959 a booklet of 80 pages entitled *Elements of Progressive Patient Care* which is based on studies made by a team which was appointed in 1956. P.P.C. is defined as "the organization of facilities, services, and staff around the medical and nursing needs of the patient." Patients are grouped according to their degree of illness and need for care. The general hospital of the future is envisaged as a community health centre concerned with the care of long-term (including the mentally ill) as well as short-term patients. There are five elements in the present concept of P.P.C.; four are contained within the general hospital: (1) *the intensive care unit,* where critically ill patients are concentrated regardless of diagnosis; (2) *the intermediate care unit,* where the average hospital patient is to be found; (3) *the self-care unit,* for ambulant patients who are physically self-sufficient; and (4) *the long-term care unit,* where skilled medical and nursing care play an important part.

It has long been obvious that not all patients entering a general hospital require the full resources of a traditional ward. The indignity of being routinely "put to bed" has been surprisingly tolerated by the public. The patient who is admitted for diagnostic investigations or for treatment such as physical therapy or radiation, the diabetic in for regulation and advice, the post-coronary patient who requires observation of his tolerance of activity, the patient with the mild emotional disorder—are examples of hospital patients who need only simple, hotel-room type of accommodation. It should be possible to provide for them in a more home-like atmosphere with only the necessary supervision and guidance. The patient's schedule can be outlined for him on admission, he takes his meals in a cafeteria or restaurant, and restrictions are minimal. A good case could be made out for the "ambulant wing."

The argument for the intensive-care unit is less convincing, but it may have a part to play in the smaller hospitals of the future. At this end of the scale we have the desperately ill patient whose life is going to be

saved only if constant observation by a highly trained staff, skilled in the handling of modern apparatus and in emergency treatment, can be provided. It cannot be said that this level of care can always be guaranteed in the general wards of smaller hospitals. In large hospitals with special departments the need for such a unit should not arise. In the U.S.P.H.S. booklet, mentioned above, examples are given of the types of patient who might be nursed in such a unit: major surgical cases following release from the recovery room, multiple injuries or burns, major haemorrhage, and myocardial infarction. The team should be skilled in the observation of vital signs, the measurement and recording of fluid intake and output, the detection of complications, the administration of intravenous fluids and oxygen, the techniques of suction, catheterization and bladder irrigation, wound

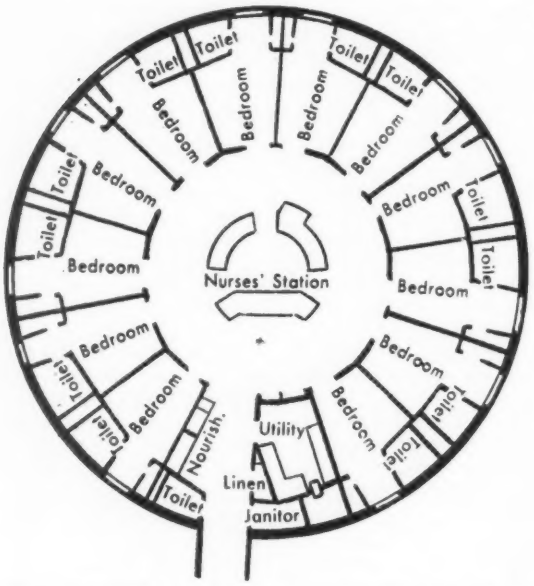


FIG. 10.—Special experimental observation unit at Rochester Methodist Hospital, Rochester, Minnesota.

dressing, anticoagulant therapy, and the management of the various forms of respiratory paralysis.

Many problems would have to be faced in setting up an intensive care unit in a hospital. Policies of admission and transfer would have to be thoroughly studied. If direct admissions to the unit could not be arranged the advantages claimed for it would be reduced. Experience at Manchester Memorial Hospital, Connecticut, well illustrates many of the factors requiring consideration (Thoms *et al.*, 1958).

At the Rochester Methodist Hospital, staffed by the Mayo Clinic, an experimental intensive-care unit of circular design has been built (Fig. 10). It consists of twelve single rooms placed around the edge of the circle with the nursing station in the centre, from which each patient can be seen. To establish a check on the studies made there a control unit of conventional rectangular design has been set up in another part of the hospital. In a recent monograph published by the American Hospital Association (Sturdavant, 1960) the experience gained in these two units in the past three years has been brought together.

Various estimates have been made of the percentage ratios in a classification of hospital patients according to their needs. Observations at Manchester, Connecticut, thus far suggests that 60% need the normal intermediate care, 20% intensive care, and 20% self-care. The notion of patients progressing through three departments of a hospital will no doubt raise many eyebrows. But the *majority* would still be treated in the average ward. The new idea is only that some patients need more, others less, treatment, and this approach might increase efficiency, reduce costs, and stimulate experiment. In this country, McKeown (1958, 1959, 1960) has used the phrase "the classification of patients according to their needs" in a somewhat different sense. He suggests the bringing together of all facets of hospital work to a common site. By appropriate designing and equipment the three great groups of hospital patients—the acutely ill, the chronic sick, and the mentally afflicted—could be cared for in multiple buildings in a common site. The standard of care of the second and third class of patients should then rise. Token psychiatric and geriatric departments in a teaching hospital may satisfy the teachers and help the students, but in the long run a much bolder plan is necessary in hospital organization if these relatively neglected subjects are to be tackled in a determined manner.

The Future

In *Architecture U.S.A.* McCallum (1959) writes: "For the young European architect an American Grand Tour is becoming as important as the Italian was to the eighteenth-century English gentleman." Although Mr. McCallum did not touch on hospitals, the three conditions for great architecture which he mentions—a prosperous and lively building industry, creative freedom, and conspicuous expenditure—have undoubtedly led to the development of a flourishing school of hospital architecture in America.

It must have surprised many in this country to learn that in the recent architectural competition for the new medical teaching centre for Wales, at Cardiff, "many competitors scarcely progressed beyond drawing bubble diagrams with a T-square." (*The Architects' Journal*, June 2, 1960). This is a pity, because in the next quarter of a century our hospital architects are going to enjoy golden opportunities. British requirements and tastes may differ from the American, but Medicine on both sides of the Atlantic is being transformed. The new dimensions in Medicine must find adequate expression in the design and function of our teaching hospitals.

I wish to thank the council of the Association for the Study of Medical Education for inviting me to undertake this visit to the United States, and the Commonwealth Fund of New York for their generous financial support. For permission to reproduce photographs I am indebted to Dr. George N. Aagaard, Dean of the Medical School, Seattle: and Dr. George T. Harrell, Dean at the Florida Medical School, Gainesville.

REFERENCES

Bauer, Walter (1959). *Trans. Ass. Amer. Phycns*, **72**, 1.
British Medical Students' Association (1960). Report on the Teaching of Psychiatry and Psychological Medicine in British Medical Schools. Prepared by R. N. M. Macsween.
Harrell, George T., jun. (1956). *J. Amer. med. Ass.*, **161**, 700.
—— (1957). *J. Fla med. Ass.*, **44**, 254.
—— (1958). Ibid., **45**, 296.
Karnovsky, M. L. (1957). *Harv. med. Alumni Bull.*, 1957.
Lippard, V. W. (1955). *J. med. Educ.*, **30**, 698.

McCallum, Ian (1959). *Architecture, U.S.A.* The Architectural Press, London.
McKeown, T. (1958). *Lancet*, **1**, 701.
—— (1959). *Brit. med. J.*, **1**, 316.
—— (1960). *Architects' J.*, **132**, 4.
Stowe, L. M. (1959). *J. med. Educ.*, **34**, 1059.
Sturdavant, M. (1960). *Comparisons of Intensive Nursing Service in a Circular and a Rectangular Unit.* American Hospital Association.
Thoms, E. J., Giddings, L., and Lockward, J. (1958). *Mod. Hosp.*, **90**, No. 5, p. 73.
University of Florida Press (1954–5). *Planning Florida's Health Leadership.* Ed. Louis J. Maloof, Vols. 1–5. Gainesville, Florida.
Willard, W. R. (1960). *J. med. Educ.*, **35**, 93.

Medical Memoranda

Pruritus Ani Complicating Transplantation of the Ureters

This is a case report of an uncommon condition. No detailed records of a previous case have been found by either the B.M.A. or Smith Kline and French libraries.

Jacobs and Stirling (1952) mention one case of proctitis in a series of 1,673 patients. Clarke and Leadbetter (1955) do not record any cases in a series of 2,897 patients.

The discomfort suffered by my patient was severe enough to make his history worth reporting in detail.

Case Report

The patient first had haematuria in 1936. A simple papilloma was removed at open operation. He remained well until 1942, when he suffered a relapse and required operation with fulguration. He had no further haematuria until 1953, when a recurrence of the papilloma was treated by diathermy at cystoscopy. In 1955 he had another resection. Until then all histological reports had described a simple papilloma.

In 1956 he had more bleeding. A diagnosis of malignant papilloma of the bladder was made, and in consequence he received two courses of deep *x*-ray therapy.

In January, 1958, he suffered a severe prolonged haemorrhage which was treated by cystectomy and colonic transplantation of the ureters. It was not possible to remove the whole bladder and some malignant tissue was left behind. The histological report after his discharge from hospital was "transitional cell carcinoma of the bladder." He remained well until March, 1959, apart from some urethral leakage of blood from the malignant stump, and an incisional hernia. At the beginning of March, 1959, he complained of pruritus ani which he himself had treated, unsuccessfully, with 1% cinchocaine ointment. I persuaded him, with difficulty, to allow me to examine him.

He had anal dermatitis. The skin was red, raw, and weeping. The lesion began at the upper end of the natal cleft and extended anteriorly over the entire perineum to the scrotum. It was beginning to affect the skin over the buttocks. The itch was intense. Cinchocaine and coal tar failed to produce improvement. By the beginning of April the dermatitis had spread over the entire scrotum and was advancing over the pubic symphysis to the anterior abdominal wall.

On April 7 biochemical investigations were begun. The urinary *p*H was 9 and the urinary ammonia was 230 mg./100 ml. (expressed as total nitrogen: normal = 50 mg.). Serum sodium, potassium, chloride, and carbon-dioxide-combining power were all within the normal range. The high ammonia reading suggested that the cause of the dermatitis was ammoniacal irritation following decomposition of the urine by urea-splitting organisms. Bacteriological culture of anal and perianal swabs yielded "growth of *B. proteus* sensitive to chloramphenicol, streptomycin, and nitrofurantoin."

His treatment was changed to topical magnesium sulphate and oral sulphafurazole. On April 17 the urinary ammonia was 226 mg./100 ml., and the *p*H was 9. There was some clinical improvement, but not sufficient to justify perseverance with this treatment. It was altered to ¼% hydrocortisone in lactocalamine applied twice daily and oral nitrofurantoin 50 mg. four times daily. By May 1 the itch had gone and the skin lesion was dry and healing. The urinary ammonia was 198 mg./100 ml., though the *p*H was 9.5. A culture of an anal swab on May 4 yielded "no intestinal pathogens notwithstanding the use of enrichment media." Because of the marked improvement all treatment was stopped, and on May 22 the urinary ammonia was 46 mg./100 ml. and the urinary *p*H 7.5.

The patient remained clinically well and required no further treatment until August, 1959, when he had further urethral bleeding, for which he was admitted to a hospital for chronic diseases. He had no further pruritus.

Comment

The clinical course and investigations indicate that the patient's pruritus ani was produced by ammoniacal dermatitis. The source of the ammonia appears to be the decomposition of urea to ammonia by *Proteus* (probably *vulgaris*).

The following features of the case require comment: (1) the infrequency of the condition, (2) the anomalous behaviour of the urinary *p*H, and (3) the choice of treatment.

Proteus vulgaris is often found in small amounts in the normal bowel and is a frequent invader in the deranged bowel. It is a potent urea-splitting organism. Why, therefore, is ammoniacal dermatitis such an infrequent complication of uretero-colic anastomosis?

Though the urinary ammonia in this case had dropped from 240 to 198 mg./100 ml. by the third reading the urinary *p*H had risen from 9 to 9.5. This may be accounted for by the fact that the urine of patients with transplanted ureters is frequently alkaline, owing to chloride retention (L. N. Pyrah, 1959, personal communication). Nevertheless the high urinary ammonia must have contributed to the raised urinary *p*H.

Sulphafurazole was selected as the first antibiotic to attack the proteus in order to avoid the possibility of diarrhoea produced by secondary bacterial invasion after more potent antibiotics. Since it was not effective enough, it was replaced by nitrofurantoin.

Local treatment was chosen on clinical grounds. The dermatitis was refractory and refused to respond to any treatment other than hydrocortisone. Since the itch was intense, local treatment was necessary until the antibiotic had produced a significant result.

I thank my senior partner, Dr. D. Jacob, who gave permission to manage and report the case; and Dr. F. Mitchell and the staff of the biochemical department of Maryfield Hospital, Dundee, and Dr. Green and the staff of the bacteriological department of Queen's College, Dundee, for performing the laboratory investigations and for helpful suggestions. All surgical treatment was done by Mr. G. M. Sturrock, of the Royal Infirmary, Dundee.

ALBERT JACOB, M.B., Ch.B.,
General Practitioner, Dundee.

References

Clarke, B. G., and Leadbetter, W. F. (1955). *J. Urol.*, **73**, 999.
Jacobs, A., and Stirling, W. B. (1952). *Brit. J. Urol.*, **24**, 259.

Reviews

ANAESTHESIA

General Anaesthesia. Edited by Frankis T. Evans, M.B., B.S., F.F.A. R.C.S., D.A., and Cecil Gray, M.D., F.F.A. R.C.S., D.A. Volume I: *Basic Principles.* Volume II: *Techniques, Special Fields, and Hazards.* (Pp. Vol. I; 531 +29+xi; Vol. II: 431+29+xiii; illustrated. £7 7s. per set.) London: Butterworth and Co. (Publishers) Ltd. 1959.

It is some thirty years since Dr. Boyle wrote his book on anaesthesia, and the manner in which the specialty has grown and the increasing importance of the role of the anaesthetist is clearly shown by the range and variety of the material included in this book.

General Anaesthesia has been compiled by no fewer than 39 contributors and is a textbook which surpasses *Modern Practice in Anaesthesia*, first published in 1949 by the same firm of Butterworth.

The first volume covers basic principles and includes anatomy, physiology, neurophysiology, and pharmacology; in particular the chapters on water and electrolyte balance, the relaxants, and the pharmacology of volatile and gaseous anaesthetics are excellently written and full of information. The second volume deals with the special fields of anaesthesia, its techniques, and hazards. The methods of measurement in anaesthesia are of interest to everyone and must surely be enlarged in a later edition. It is surprising, however, that in such a comprehensive book no mention is made of anaesthesia for ear, nose, and throat surgery, plastic surgery, or in the management of burns.

The decision of the editors, that spinal and local anaesthetic techniques should be excluded is perhaps unfortunate, as their inclusion would have made these volumes a complete survey of modern anaesthetic practice. They are, nevertheless, to be congratulated on their work in producing what will certainly become a standard textbook. A high standard of writing has been achieved and the volumes will surely be indispensable to the student as well as providing a useful source of reference for both teachers and research workers.

The production of the book is excellent, but for the price more illustrations and diagrams might have been provided.

H. WOODFIELD-DAVIES.

TOP PEOPLE TALKING

Ciba Foundation Tenth Anniversary Symposium on Significant Trends in Medical Research. Edited by G. E. W. Wolstenholme, O.B.E., M.A., M.B., M.R.C.P., Cecilia M. O'Connor, B.Sc., and Maeve O'Connor, B.A. (Pp. 356+xii; illustrated. 50s.) London: J. and A. Churchill, Ltd. 1959.

This volume reports a symposium which was held at the Ciba Foundation in June, 1959, in celebration of its tenth anniversary. The first impulse of a reviewer is to wish the Ciba Foundation many happy returns and to congratulate Dr. Wolstenholme and the trustees on their magnificent service to British and international medicine.

Thirty medical scientists of great distinction—seven of them Nobel prize-winners—attended. Twelve scientific papers were presented, varying from "Fluorimetric Studies on Pyridine-nucleotide Enzyme Complexes," by Professor Theorell, to "Population Dynamics of Body Cells," by Sir Macfarlane Burnet. This book gives us an opportunity to follow, and to seek to understand, the new dimension in medicine. Though some of it is difficult to comprehend, at least by one ignorant reader, yet the ageing may sustain themselves by the thought that they would have read it with almost total lack of understanding 20 years ago. No doubt the distinguished audience found it not too difficult, but a study of the discussions shows that no clinician was intrepid enough to discuss molecular structure or the chemical basis of virus multiplication, that the physiologists were foremost in debating physiological problems, and the chemists most fertile in chemical controversy. Yet the cheerful conclusion from this symposium is that communication is practicable between top scientists, and Sir Harold Himsworth in his closing remarks suggested that medicine is again becoming one "intellectual continuum." One distinguished physiologist took part in a discussion, although he was not amongst those who attended. Such psychic phenomena may find a place in the programme of the symposium in 1969.

D. V. HUBBLE.

THE PRINCIPLES OF ORTHOPAEDICS

Orthopaedics: Principles and their Application. By Samuel L. Turek, M.D. (Pp. 906+xix; illustrated. £8.) London: Pitman Medical Publishing Co., Ltd. 1959.

During this century many books on fractures have been published, whereas orthopaedics, as we now recognize it, was included in the textbooks of general surgery. In recent years, since the appearance of specialist works suitable for students, the two outstanding books on deformities and orthopaedic surgery, written thirty or more years ago, have been little read.

Dr. Turek has here written a work of considerable merit—scientific and comprehensive. Basic principles, such as embryology and the physiology of bones and joints, including histology of the structures of the locomotor system, are well stated; and interesting subjects, including the role of the adrenals in new bone formation and the functions of parathormone, are discussed. The greater part of the volume is arranged in a standard textbook manner, and the nomenclature of disease used is that taught in British medical schools. Up-to-date information is provided on metabolic bone disease and developmental conditions. Affections of the spinal cord, peripheral nerves, muscles, and blood vessels are described systematically. Half the book is given to regional conditions, but congenital abnormalities are described elsewhere. Adequate and not excessive information is given on flat foot, scoliosis, and the surgery of the intervertebral disc. There are a few pages on radioactive isotopes in orthopaedics.

It is somewhat disappointing that little is written of the reasons for alternative procedures and of the prognosis. Possibly this results from the increasing tendency in North America for the patient to come into the hands of those responsible for rehabilitation very soon after operation.

The choice and the reproduction of the 600 illustrations are good and will help every reader. This book will be useful to many, particularly during years of intensive study with a view to work in this field.

ST. J. D. BUXTON.

AORTO-ILIAC OBSTRUCTION

L'Arteriopatia Ostruttiva Aorto-iliaca. Motivi Clinici, Spunti Patogenetici. By Ennio Muntoni. Contributions by J. Del Moro, R. Liscia, and F. Pizzetti. Preface by Pietro Valdoni. (Pp. 185; illustrated. L. 3,000.) *Giornale di Gerontologia,* Supplement No. XV. Fidenza: Tito Mattioli. 1959.

This book dealing with obstructive aorto-iliac disease begins with a consideration of the syndrome of Leriche, which the author considers to occur relatively infrequently. This condition, of course, is the complete

obstruction of the aorta at the level of the bifurcation. There are other abnormalities to which the author calls attention. In all he presents 70 cases studied in detail. Some of these had only aorto-iliac stenosis. The visceral symptoms of these obstructions are described, such as dyspepsia or bowel disorders, and renal complications are also mentioned. Neural derangements are found in some 40% of cases. The aortograms are very good indeed; clear and vivid to a remarkable degree. The values of endarterectomy and resection and grafting are discussed. The book gives an interesting and complete account of a condition which may be commoner than is suspected hitherto, and for which something can sometimes be done.

There is a full bibliography. A summary in English is provided, but the text is easy.

TERENCE EAST.

MEASURING OXOSTEROIDS

Oxosteroids. The Use of Phenolic Hydrazides for Detection, Characterization, and Estimation. By Bernard Camber, M.D. (Pp. 79+viii; illustrated. 12s. 6d.) London: H. K. Lewis and Co., Ltd. 1960.

This monograph is based on an M.D. thesis and consists of a review of the existing methods for detecting and measuring oxosteroids followed by an account of the author's work in developing new reagents for this purpose. Much space is devoted to his earlier, largely unsuccessful attempts to discover such a reagent, but it is the last section of 22 pages dealing with the use of salicyloyl hydrazide that will attract most interest.

The work described was completed in 1956 and reported in 1957 (*Clin. chim. Acta*, **2**, 188). This monograph, also, shows evidence of having been written some years ago. For example, it would seem to be unnecessary in 1960 to discuss the deficiencies of measuring urinary reducing and formaldehydogenic steroids while omitting to mention Porter and Silber's phenyl-hydrazine methods, the reactions of Gornall and MacDonald with 2:4-dinitrophenylhydrazine, and Weichselbaum's iso-nicotinic acid hydrazide technique. The description of the principles underlying Norymberski's methods is even more unfortunate. Here Dr. Camber implies that boro-hydride reduction followed by bismuthate oxidation yields 17-ketones only from steroids with mono- or dihydroxy-acetone side chains, and ignores the important contribution of glycerol and 17:20-glycol side chains.

The most important section is that concerned with the preparation and properties of salicyloyl hydrazones. The value of this section as a practical laboratory guide is enhanced by the clarity of experimental instructions and a number of excellent tables. However, on the whole, the production of the monograph is poor. There are many typographical errors, Figs. 3 and 5 are interchanged, Fig. 8 is referred to in the text when Fig. 7 is apparently intended, and in one instance the formula of testosterone is given incorrectly.

The appeal of such a specialized book is inevitably limited, but Dr. Camber's methods will be a welcome addition to the tools available for tackling problems of steroid identification and measurement.

R. V. BROOKS.

The collection of articles published by the Medical Press (Baillière, Tindall and Cox, 33s.) in its *Modern Treatment Yearbook 1960* provides in readable form the views of expert contributors on current problems in diagnosis and treatment. It is edited by Sir Cecil Wakeley.

BOOKS RECEIVED

Review is not precluded by notice here of books recently received.

Can This Marriage be Saved? By Paul Popenoe, Sc.D., and Dorothy Cameron Disney. (Pp. 299+xx. 34s. 6d.) New York and London: The Macmillan Company. 1960.

The Structure and Function of Muscle. Edited by G. H. Bourne. Volume I: *Structure.* (Pp. 472+xvi; illustrated. $14.) New York and London: Academic Press. 1960.

Medical Electronics. Proceedings of the Second International Conference on Medical Electronics, Paris, June 24-27, 1959. Edited by C. N. Smyth, M.A., B.Sc.(Eng.), B.M., B.Ch., M.I.E.E. (Pp. 614+xxiii; illustrated. £7 5s.) London: Iliffe and Sons, Ltd. 1960.

The Climate of Health. By Sir Kenneth Cowan, M.D., F.R.C.P.Ed., D.P.H., Q.H.P. The John Matheson Shaw Lecture delivered on November 4, 1959, at the Royal College of Physicians of Edinburgh. (Pp. 38.) Edinburgh: The Royal College of Physicians. 1960.

Pocket Calorie Guide to Safe Slimming. By Jane Colin. (Pp. 50. 4s. 6d.) London: Constable with Arlington Books. 1960.

A Synopsis of Biology. By W. B. Crow, M.Sc.(London and Wales), Ph.D., D.Sc.(London). (Pp. 1,056+xv; illustrated. 90s.) Bristol: John Wright and Sons, Ltd. 1960.

Specific and Non-specific Tuberculin Sensitivity in Man in the Netherlands. By Dr. M. A. Bleiker. (Pp. 62; illustrated. Fl. 14.50.) Assen: Van Gorcum and Co., N.V., for the Organization for Health Research T.N.O. 1960.

Differentialdiagnose und Therapie der Gesichtsneuralgien. By Dr. Wilhelm Umbach. Foreword by Professor Dr. T. Riechert. (Pp. 142+viii; illustrated. DM. 22.50.) Stuttgart: Georg Thieme Verlag. 1960.

Fractures, Dislocations, and Sprains. By Philip Wiles, M.S. (Lond.), F.R.C.S.(Eng.), F.A.C.S. (Pp. 67; illustrated. 27s. 6d.) London: J. and A. Churchill, Ltd. 1960.

Industrial Pulmonary Diseases. A Symposium held at the Postgraduate Medical School of London, September 18-20, 1957, and March 25-27, 1958. Edited by E. J. King, M.A., D.Sc., F.R.I.C., and C. M. Fletcher, C.B.E., M.D.(Cantab.), F.R.C.P. (Pp. 273+viii; illustrated. 32s.) London: J. and A. Churchill, Ltd. 1960.

Radioactivity for Pharmaceutical and Allied Research Laboratories. Edited by Abraham Edelmann. *A Symposium Sponsored by Nuclear Science and Engineering Corporation, held in Uniontown, Pennsylvania.* (Pp. 171+xii; illustrated. $6.) New York and London: Academic Press. 1960.

Language Development and Language Disorders: A Compendium of Lectures. By Nancy E. Wood. (Pp. 95. $2.75.) Lafayette, Indiana: Child Development Publications of the Society for Research in Child Development, Inc. 1960.

A Synopsis of Public Health and Social Medicine. By A. J. Essex-Cater, M.R.C.S., L.R.C.P., D.C.H., D.P.H., D.I.H., F.R.A.I. Foreword by J. M. Mackintosh, M.A., M.D., LL.D., F.R.C.P. (Pp. 563+xii. illustrated. 55s.) Bristol: John Wright and Sons, Ltd. 1960.

The Liver and Cancer. A New Cancer Theory. By Kasper Blond, M.D., F.I.C.S. Foreword by E. Stanley Lee, M.S., F.R.C.S. Second edition. (Pp. 416. 35s.) Bristol: John Wright and Sons, Ltd. 1960.

Electrocardiography: Principles and Practice. By Ernest Bloomfield Zeisler, M.D. (Pp. 374+x; illustrated.) Chicago: Login Brothers. 1960.

The Collected Papers of Paul Ehrlich. In Four Volumes including a Complete Bibliography. Compiled and edited by F. Himmelweit, M.D., Ph.D., F.R.C.P.Ed., with the assistance of the late Martha Marquardt. Under the editorial direction of Sir Henry Dale, O.M., G.B.E., F.R.S., M.D., F.R.C.P. Volume III: *Chemotherapy.* (Pp. 615+viii; illustrated. £8.) London, Oxford, New York, Paris: Pergamon Press. 1960.

A Bibliography of Internal Medicine. Selected Diseases. By Arthur L. Bloomfield, M.D. (Pp. 312+viii. 48s.) Chicago: University of Chicago Press. London: Cambridge University Press.

Directory of the Medical Library Association. Foreword by John F. Fulton, M.D. Second edition. (Pp. 274+xxxi. 56s.) London: Mark Paterson for Shoe String Press. 1960.

BRITISH MEDICAL JOURNAL
LONDON
SATURDAY SEPTEMBER 10 1960

HOSPITAL DIFFICULTIES TO-DAY

Two out of three of all the hospitals of this country were built on their present sites over seventy years ago. Until 1948 money for their maintenance and development was hard to come by, and financial supply for their improvement during the first twelve years of the National Health Service has been niggardly. General discontent with the existing hospital structure is therefore not surprising, but the picture is not as dark as it is sometimes painted by those who work in them and feel frustrated by their obvious defects. Despite inevitable difficulties, hospitals in the past twelve years have treated more patients than they ever did before, and the over-all standard of their work is undoubtedly much higher than in the past. Although most of the credit for that achievement is due to improved staffing, and particularly to the wider diffusion of consultant services, tribute should be paid to the management committees that have transformed some derelict premises in the manner illustrated in Sir Allen Daley's historical survey (p. 758) and have improved facilities. Nevertheless the position is thoroughly unsatisfactory, and Mr. Lawrence Abel and Mr. Walpole Lewin[1] were justified in their demand for a substantial increase in the capital grants allocated to hospitals—a demand to which the Representative Body has given full support.[2] Despite the remarkable growth in the number of patients treated, hospital waiting-lists are longer and are still rising, and this is the most serious failing in the National Health Service to-day. A vast amount of relievable disability goes untended in such conditions as hernia, varicose veins, haemorrhoids, and prolapse. The recovery of the country from the effects of war now justifies adequate capital appropriation for reconstruction of the chaotic hospital system that regional boards inherited on the appointed day, and papers in this special number deal with many aspects of planning for the future.

Lord Taylor (p. 752) calls for a master plan before building is undertaken, and says that definition of the population to be served (and its trends), together with careful analysis of its prevailing morbidity, are indispensable preliminary steps. That, theoretically, is desirable, but translation into action is not so easy. Information about the population to be served and its age structure is available, and is the subject of another leader, but there is practically none about morbidity. The College of General Practitioners has instituted research, for which it deserves thanks as well as encouragement, and the Nuffield Foundation has accumulated some data ; but information relevant to hospital planning is most likely to be obtained from careful statistical examination of the waiting-lists of separate hospital departments. In the Birmingham region the results of such an analysis will be available shortly, but they may not be applicable to the whole country.

On an empirical basis Mr. Walpole Lewin and Dr. J. O. F. Davies (p. 763) suggest as a basis for planning that three beds in acute general hospitals per thousand population may prove adequate, and, if that be accepted, and it be also agreed that the optimum size of an efficient general hospital is between 600 and 800 beds, it follows that communities numbering fewer than 200,000 people should not be provided with general hospitals save in exceptionally isolated parts of the country. Regional boards, therefore, should be encouraged to turn their attention to "area planning" based on considerations of this kind rather than on the original, admittedly extravagant, estimate of five beds per thousand. The extraordinary number of small hospitals in England—with all that that implies—is a hangover from the date of their foundation, when travel by the sick was mainly by horse transport. Motor-cars, comfortable ambulances, and helicopters have made the preservation of most of these small institutions unnecessary, though Abel and Lewin think they should continue as general-practitioner hospitals. There is something to be said for this in very remote areas, but most of them might be better adapted to serve either as health centres or as departments to be used like the successful experimental one provided by the Nuffield Foundation at Corby, which enables general practitioners to have access to *x*-ray and other facilities as well as direct contact with visiting consultants. Professor T. McKeown[3 4] has stated a case for an "integrated hospital community" by which all types of hospital work should be brought to a single site. He considers that adjoining an acute general hospital beds should be provided in separate buildings for the chronic sick and the mentally ill so that one united staff could care for all of them. The difficulty in implementing this attractive proposal is that sites sufficiently large are rarely available in populous areas ; where they are, the experiment should certainly be tried.

On the design of hospital buildings there is little agreement. In an admirable paper Professor Llewelyn Davies (p. 768) shows conclusively that the idea of demountable building made up of parts

[1] Abel, A. L., and Lewin, W. S., *Brit. med. J., Suppl.*, 1959, **1**, 109.
[2] *Brit. med. J., Supplt.*, 1959, **2**, 70.
[3] McKeown, T., *Lancet*, 1958, **1**, 701.
[4] —— *Brit. med. J., Suppl.*, 1959, **1**, 122.
[5] *The Times*, August 19, 1960.
[6] Slesinger, E. G., *The Times*, August 23, 1960.

which can be separated easily and reassembled in different form to meet changing need is quite impracticable. How, then, can hospital plans be made to meet the changes that will inevitably occur within a few years in response to rapid progress in medical and other sciences? He points out that ward blocks are relatively "static," and may be built in the assurance that they will be efficient over a long period of time provided that they are properly designed. It is in the technical "service" departments, in the theatres, the *x*-ray rooms, the laboratories, as well as in the accommodation for central sterile supplies and in the provision for out-patient investigation and casualty treatment, that change is inevitable. Davies suggests that these departments should not be "embedded" in ward blocks but should be built immediately adjacent to them with ample space for their extension and modification as the need arises. As a general principle this is admirable, for experience has shown that the work of many hospitals is restricted by deficiency in their services rather than by lack of beds; and the difficulty of adapting space in an existing building for use as theatres or laboratories is serious and often prohibitive in cost.

No hospital to-day can ignore the pressing problem of adequate staffing. In peace-time it is very difficult to staff hospitals in remote country areas; for this reason it was impossible to use many excellent emergency hospitals built during the war, and their decayed and desolate ruins may still be seen. The difficulty in filling junior medical and surgical posts in the hospitals is notorious and steadily increasing, and some way must be found to meet this. It is much to be hoped that the long-awaited report of the Platt Committee on hospital staffing will produce the answers so far as general practitioners are concerned. Not all wish to have hospital appointments, but some do, and these should be encouraged. At least one teaching hospital employs several general practitioners in its casualty and special departments to do work formerly undertaken by residents and is pleased with the result.

The cost of the hospital service is now so great that it is a source of anxiety to the Treasury, and the present Minister of Health has pointed out (in another capacity) that no comparable sum is voted by the House of Commons with less direct control of its expenditure. More than two-thirds of the money goes in salaries and wages, and the plea for increased capital allocation is supported by the hope that modern buildings and equipment should lead to economy in maintenance as well as improved service. If that hope is to be realized senior members of hospital staffs must take an interest in financial and architectural problems that confront the hospitals. In a recent leading article on "Designing a Hospital," *The Times*[5] remarked, "If standardization of schools has proved possible that of hospitals should be feasible too." This provoked the reply from a distinguished surgeon[6] that hospitals should be designed to meet the needs of their particular work and the wishes of those who are to do it. Those who have had to deal with contracts for building and equipment, and who know the great economy that results from the use of standard patterns and the variety that is possible with them, will not easily be persuaded that personal whims and predilections should be gratified at public expense save for very exceptional reasons. The nature of the work of hospitals does not vary as much as the quality of those who undertake it—a point also made by Sir Arthur Thomson in his interesting historical review of the teaching hospitals. Sir Edward Thompson, a chairman of a regional board, has said that "from the damp-course up" he would like to have two identical hospitals serving similar areas for the same purpose, because fair comparisons of maintenance costs and efficiency of use would then be possible. At present such comparisons are difficult because all hospitals differ, and in their absence rational and fair administrative control is handicapped. Even if identical hospitals were provided, however, direct comparison would be justified only if due regard were paid to the state of the domiciliary services in the separate neighbourhoods and the co-operation of the local general practitioners in the areas they serve, because effective use of hospital beds depends to a large extent on these factors, which are not at present within the ambit of hospital administration.

HOSPITAL NEEDS AND POPULATION TRENDS

The need for and use of hospital accommodation in the future will be much affected by changes in the size and structure of the population. Many of these changes are not matters of speculation but have already been determined by past events. The population aged 20 and over in 1980 have been born, and their losses by death and migration can be forecast within relatively narrow limits. Mortality at some ages or from some diseases has fallen sharply and will doubtless continue to fall, but the general decline in mortality is subject to a degree of inertia which enables extrapolation into the future to be made with considerable confidence. Under present conditions the net balance of migration for the United Kingdom is of little numerical significance, and, though relatively more important for Scotland and Northern Ireland, the flow is sufficiently regular to permit of safe forecast.

The more uncertain element in assessing population trends is fertility. In common with many other countries of the West, notably the U.S.A., Great Britain has experienced a recent upsurge in the birth rate. In this country it has taken place since 1955 and is still continuing, though at a much diminished pace. It is mainly due to high marriage rates, marriages at younger ages, and faster production within marriage of the desired number of children. All this produces a temporary acceleration in the flow of births. A permanent rise in the flow would come about only if there were, in addition, an increase in the average size of family. Whether this is happening is not yet clear from the information available to the Registrar-General for England and Wales,[1] and will not be clear until recent marriages have lasted for at least ten years. By that time the ultimate family size can be more certainly forecast. In planning for the future there is a choice between assuming an actual increase in family size, with a permanent rise in the level of births, and assuming that there will be no further increase in marriage rates or proportions married at young ages, that family size will not increase, and that the higher annual numbers of births registered since 1955 represent borrowing from later years. Official policy is apparently to take a middle course. The latest projection to be published[2] in respect of England and Wales (from June 30, 1959) assumes "annual births averaging 730,000 in the first five years, thereafter rising gradually to 790,000 in 1997 and later years." These figures compare with a total of 750,000 or so in 1959.

Apart from alterations in the use of hospitals owing to medical advances (the possibility of which is as important as any other factor in forward planning), variations in hospital accommodation are likely to be needed owing to the population changes which are already for the most part inevitable. In England and Wales the increase in population expected (on the official projection[2]) between 1959 and 1999 is 15%. Thus if morbidity in the population and the policy on admission to hospital remain as at present—important provisos—the total bed accommodation needs to be increased by at least one-sixth over the next forty years. This gives only a very broad view, for account must be taken also of the variations in the numbers of people at different ages, notably the old and the young. For instance, the expected increase in children aged under 15 is 11%, while that for men aged 65 and over is 46% and for women at this age 34%. At ages 15–44 the increase for men is 22% and for women 16%, but at 45–64 the figures are well below the average of 15% for the whole population, being 7% for men and −3% (i.e., a decrease) for women.

At the end of 1958 there were 483,082 staffed beds in the National Health Service.[3] In the following Table the number has been analysed by department of medicine or surgery and adjusted to allow, first, for the increase necessary to remove the current waiting-list, and, secondly, to accommodate the increase implied by the population changes likely to occur by 1999. The first of these adjustments is made by multiplying the increase in the waiting-list over the year by the average duration of stay (to get the bed-days), dividing by 365, and adding 15% to allow for unoccupied beds (i.e., the turnover interval). The population adjustment is not so easy. The General Register Office has not yet published from its in-patient analyses any representative discharge rates by specialty and age. The only representative data published are for 1958; these did not appear until 1960 and the analysis is limited to a breakdown by diagnostic group and hospital region. It is therefore necessary to estimate the age groups mainly concerned in the demand for a particular specialty and to allow for the population increases in these age groups. The actual increases must be regarded only as illustrative.

Estimates, by Medical Departments, of Hospital Beds needed in 1999 Compared with Numbers Existing in 1958, England and Wales

Department	Beds at 31/12/58	Add for Waiting-list (Rounded)	Add for Population Increase		Beds Needed in 1999
	No.	No.	%	No.	
General medicine	34,059	−90	15	5,110	39,169
Paediatrics	6,761	—	10	680	7,441
Infectious disease	8,048	—	10	800	8,848
Diseases of chest	24,534	−50	15	3,680	28,214
Dermatology	2,188	—	15	330	2,518
Neurology	1,042	10	15	160	1,202
Other medical	1,055	20	15	160	1,215
Geriatrics	15,594	—	40	6,240	21,834
Chronic sick	42,510	−350	35	14,880	57,390
General surgery	34,409	160	15	5,160	39,569
E.N.T.	7,011	−60	10	700	7,711
Traumatic and orthopaedic	17,593	160	20	3,520	21,113
Ophthalmology	4,275	20	30	1,280	5,555
Radiotherapy	1,836	—	30	550	2,386
Urology	1,218	−20	20	240	1,458
Thoracic surgery	2,385	−20	15	360	2,745
Other surgical	2,819	80	15	420	3,239
Gynaecology	9,451	−80	10	950	10,401
Obstetrics	16,148	—	15	2,420	18,568
Special care babies	1,742	—	10	170	1,912
Mental deficiency	57,670	—	10	5,770	63,440
Mental illness	156,329	—	20	31,270	187,599
Convalescent	7,838	—	15	1,180	9,018
General practitioner	10,353	30	15	1,550	11,903
Other	16,214	10	10	1,620	17,834
	483,082	−120	18	89,200	572,282

The percentages in Col. 4 (except the last) are weighted averages based on diagnostic group-age admission rates[4] rounded to the nearest 5%.

These calculations show the possible need for 89,200 more beds in 1999, and for 40,000 more even within 20 years. But they are not sufficiently detailed; they should be based on a finer breakdown of the population changes and on admission rates by specialty and age which are not yet available. Allowance should be made for trends in morbidity and for possible changes in average length of stay.

[1] General Register Office, *Statistical Review of England and Wales, Part III Commentary*, 1959, H.M.S.O.
[2] —— *Quarterly Return for England and Wales*, 1960, No. 444, H.M.S.O.
[3] Ministry of Health, *Report for the year ended December 31, 1959, Part I*, Cmnd. 1086. H.M.S.O.
[4] General Register Office, *Statistical Review, 1955*, Supplement on Hospital In-patient Statistics, 1959.

Above all, the calculations should be on a local basis. These sums are not difficult to do or to explain, and they might well form part of the routine work of hospital boards. There is a statistical unit in the Ministry of Health to collect and provide the data and to co-ordinate this kind of intelligence work.

Apart from the population changes which will provide not only more people but especially more old people, there is another hard demographic fact to be borne in mind—namely, the demand for hospital care has not been diminished by the small improvement in longevity achieved over the last decade or two. Indeed, to the extent to which this small average extension of life is attributable to medicated survival the demand may even be increased. The trend of demand cannot be properly assessed until annual morbidity rates are available. There is a statistical lacuna here for the Ministry of Health to fill.

HOW FAR INTO THE FUTURE?

The assumption lying behind the contributions on hospitals in this number of the *B.M.J.* seems to be that the hospital needs of the population will increase, though it is true that most agree that approximately three hospital beds per thousand of population is a safer estimate of what is wanted than the more extravagant estimate made immediately after the war of five beds per thousand. To build a hospital costs money, and costs are likely to go up rather than down; for that reason alone we should think much more about what is needed not only in the immediate future but beyond that. The experience of the last twelve years shows that basically the regional system of administration is a good idea, and an idea that should be expanded by the devolving of still more responsibility by the Ministry of Health to regional boards. The hospital problems of any one region is only one aspect of the care of the population it serves. We understand that the Planning Committee of the Birmingham Regional Hospitals will shortly advise its board to sponsor a conference of all interested authorities to discuss the possible integration of the three divisions of the N.H.S. under a single authority such as a Regional Board of Health. This is a matter that the Ewart Smith Committee on the efficiency of hospitals might well consider. One of the fundamental weaknesses of the N.H.S. is the sharp separation the Acts of 1946 and 1947 put between the hospital service, general practice, and public health. In particular, it seems to have introduced a professional division between consultants and general practitioners that did not exist before the appointed day of 1948. If the end of the second decade of the N.H.S. could witness, at least in some areas, a successful approach to the conception of a Regional Board of Health, then we might see a much closer working together of general practitioner and consultant in the care of the one and the same sick person, with all that that means from the initial diagnosis to the final restoration to a measurable degree of health and capacity to work.

The rapid advances of modern medicine and its growing complexity demand a fresh way of looking at the respective parts to be played by those working in the three main divisions of the N.H.S. As things are to-day, it is as difficult for the general practitioner to get a foothold in a hospital as it is for a hospital worker to migrate from hospital life into general practice. Year after year the view is expressed, a view usually endorsed by the Minister of Health of the time, that general practitioners want to experience the stimulating atmosphere of a hospital. Taylor believes that, while it might be desirable for some general practitioners to work in hospital, most G.P.s should be looking after the patient in the home, the clinic, the factory, and the farm: his specialty lies in coping with the problems of the patient *outside* the hospital. It has been suggested that there should be an increase in out-patient and diagnostic services, and that more casualty and out-patient departments should be equipped with beds in which a patient can be kept for observation for a few hours to a day. Certainly the part of the hospital most closely resembling the doctor's surgery is the casualty and out-patient department. This seems to be his natural foothold. And from the out-patient department he would have ready access to what he very much needs—the *x*-ray, pathological, and other hospital facilities. Such matters as these—and there are many others—could be tackled and solved if there were active participation of consultant, practitioner, and medical officer of health in the work of a regional health board. Medicine in this way would become one profession instead, as it is tending to become, three professions.

Any thinking on these lines is bound to be cluttered with preconceptions based on past experience. All professions are by their nature conservative. Those engaged in planning and organizing the medical services need to be bold enough to imitate the initiative and originality of thought which has inspired the research that has given the modern doctor the powerful modern medical tools he now has at his disposal. The revolution in therapeutics that has been brought about in the past thirty years or more has not come to an end, so it is at least permissible to speculate on some of the preventive and therapeutic possibilities which may be opened up by new discoveries. For example, there is an embarrassment of facts on the nature and cause and treatment of cancer. A tremendous effort has been made to discover a remedy which will kill the cancer cell without killing the normal cell. Some chance observation akin to the one made by Alexander

Fleming may at any time make the surgical and radiotherapeutic attack on cancer a thing of the past. The effect of such a discovery on an ageing population would empty surgical theatres and surgical beds as dramatically as the antituberculous drugs have emptied the sanatoria. Research workers all over the world are trying to unlock the puzzle of the degenerative diseases, especially of those pathological changes in blood vessels which cause so much ill-health and death in those past middle age. Bacteria may still develop new ways and means by which to slip through the mesh of modern antibiotics, but it is not rash to say that modern medicine now has bacterial infections under control. And now, too, we are within reach of preventing widespread epidemics caused by viral infections.

Long-term hospital planning should be based on some such considerations as these, as well as upon the immediate requirements of to-day. When it comes down to the practical problem of hospital construction and reconstruction, the opinions of experts and the photographic supplement to this *Journal* indicate clearly enough the way things are going. The medical man must obviously listen most carefully to the architect, Professor R. Ll. Davies, when he says that it is not possible to put up hospitals in a very temporary form: "If they are strong enough to stand up with certainty for one year they will be certain to last for 50 years." It may be rash for us to suggest that new experiments in design, new materials, new devices of modern technology may lead to a growing flexibility of hospital construction, so that the planner of 50 years or more hence will not be confronted with a building so solid that no one dare pull it down. We are impressed by Taylor's observation that a general pathology laboratory in an E.M.S. hut had been successfully adapted for modern work by an expenditure of £20,000. "Had it been tackled as a new block," he writes, "the regional board would have been lucky to escape with a bill of under £100,000." He goes on to make the shrewd thrust that it is harder to get money for modest capital reconstruction than money for a brand-new building.

Modern medicine and science advance by experiment. Those responsible for bringing to the patient's bedside the products of the research worker must also have the courage to experiment if they are to keep pace with the man in the laboratory. This special number of the *Journal* will have achieved its purpose if it encourages people to look at familiar problems in a new way, and if it sets off a few trains of thought that may emerge in practical results. There is a vast arena of questions and only a few answers. But there can be little doubt that the whole organization of the N.H.S., including its hospital problems, runs the risk of becoming a static structure unless all those engaged in its work see in it a tremendous opportunity for progressive adaptation to the needs of the population in health and disease.

MENTAL HOSPITAL PLANNING

The mental hospital is no longer thought of as an independent entity, but as constituting one part of a mental health service possessing other important resources. Ideas about building have altered radically from the accepted view at the beginning of this century of the thousand-bedded mental hospital remotely situated. New methods of treatment and the development of community mental health services have led to the view that the modern psychiatric hospital should not exceed 500 beds, should be linked with a general hospital, and, ideally, should be situated in the midst of the population it serves. Unfortunately in densely populated areas it will be difficult to obtain sites for new mental hospitals close to general hospitals, though it might be possible to supplement inadequate mental health services by establishing psychiatric units of about 100 beds in existing general hospitals—units to be staffed by the local mental hospital and working in association with it. In rural areas there is much to be said for buildings which will provide in-patient and out-patient accommodation, serve as a day hospital and as a centre for community services, and be closely linked with the parent hospital, as in the Worthing experiment.[1] For even more sparsely populated areas, the Saskatchewan plan[2] is of interest. To serve 900,000 people living in an area 400 miles by 600 miles it is proposed to establish a 150- to 300-bed unit connected to a general hospital in each of thirteen health regions.

In Denmark new hospitals of 350 beds, built in association with general hospitals, are being planned, with separate units of 250 beds intended for geriatric patients. These latter are prefabricated one-story buildings surrounding a central garden. Wards are limited to a maximum of 24 beds, with no bedroom containing more than 4 beds. In a report[3] to the World Health Organization, A. Baker, R. Llewelyn Davies, and P. Sivadon suggest that the total number of beds in psychiatric hospitals should be about 300, that wards should contain between 20 and 30 beds, that the dormitories in the wards should have 5 to 7 beds, and that there should be some single rooms.

Responsibility for much new building is being placed by the Mental Health Act on local health authorities, which are required to provide residential accommodation for patients who need not be in hospital. This will appreciably diminish the need for further mental hospital building as and when these new local services come into existence. Provision of day and night hospitals, rehabilitation units, and more out-patient departments will also replace the policy of erecting more and more in-patient blocks. Conversion of the interiors of the existing mental hospitals is going on to a greater or less extent throughout the country, for it is plainly

[1] Carse, J., Panton, N., and Watt, A., *Lancet*, 1958, **1**, 39.
[2] McKerracher, D. G., *Psychiatric Care in Transition*.
[3] Baker, A., Davies, R. L., and Sivadon, P., *Psychiatric Services and Architecture*. 1959, W.H.O., Geneva.

impracticable to replace all our antiquated buildings by modern hospitals. In the Sheffield region a scheme for each mental hospital to modernize four or five wards per year is nearing completion. Much can be done with an imaginative architectural approach to alter these solidly built structures, and already some of the apprehension associated with mental illness and mental hospitals has been allayed by brightening entrance halls and admission units. At a certain stage in the process of modernization it will be necessary to halt and consider what the eventual function of many of the wards is to be. In urban hospitals the opportunity will no doubt be taken to provide day centres, and to improve out-patient accommodation and liaison with the services provided by local authorities. In rural hospitals it seems likely that some of the existing buildings will no longer be needed for psychiatric purposes.

HOSPITAL GAZETTEER

The young doctor with hospital jobs in mind will find the *Hospital Gazetteer*,* shortly to be published by the B.M.A., a most useful book of reference. Compressed within its covers is a mass of detailed information on what every hospital throughout the United Kingdom, with the exception of mental hospitals, sanatoria, and most cottage hospitals, offers in the way of experience, accommodation, and amenities to its junior medical staff. The information is set out in guide-book form, and except for the sections for Northern Ireland and the Isle of Man the hospitals are grouped under management committees and regions. Teaching hospitals are included in their appropriate regions, and an alphabetical index helps the reader quickly to turn up a particular institution. At the end is a concise directory to the requirements for higher qualifications and the postgraduate courses available for them.

With this guide in his hand the would-be resident will be able to survey the field from an armchair. He will be able to tell whether this or that appointment is likely to provide the sort of thing he is looking for or whether another might be better. He will see at a glance the number of beds and of residents to do the work. In the case of a general hospital he will know whether some beds are allocated to specialties, what these are, and if the post is recognized for the requirements of, say, the F.R.C.S. or the M.R.C.O.G. He will be able to tell whether his bed-sitter has a telephone by the bed, whether there is a common-room (with or without T.V.), and whether there is a library to turn to. In all too few places he will see the abbreviation M/Q for married quarters. Time-off and recreational facilities are noted.

Collecting so many facts together for the first time meant tapping many sources of information, and honorary secretaries of B.M.A. Divisions as well as hospital secretaries have helped. Regular revision of the *Gazetteer* is promised, and subsequent editions no doubt will catch up with errors in and omissions from the first publication.

* Available in October, price 5s. (postage 1s.), from the Secretary, B.M.A. House, Tavistock Square, London, W.C.1.

CENTRAL STERILE SUPPLY

Several years ago the Nuffield Provincial Hospitals Trust embarked on a study of the possible merits and the organization of central sterile supply departments. The first stage in this investigation was to examine existing methods of sterilization which such departments might supersede. The findings were of such a nature that they demanded publication as an interim report,[1] on which we commented at the time of its publication.[2] It revealed serious shortcomings in the lay-out and cleanliness of rooms where sterilizing was done, in the design, installation, and particularly operation of autoclaves, and in the packaging of materials to be sterilized. In the meantime the Division of Architectural Studies of the Nuffield Foundation has collaborated with the Northern Ireland Hospitals Authority in establishing the first central sterile supply department within the National Health Service, at Musgrave Park Hospital, Belfast. This has recently been a place of pilgrimage for all those in the United Kingdom who are interested in such a project, and the description of this department and its operation by Dr. V. D. Allison on p. 772 will afford much helpful information about it to a far larger number of people.

This department sterilizes everything used in the hospital except operating-theatre instruments and fluids. The latter remain within the province of the pharmacist, for the simple reason that an entirely different type of autoclave is required for them, operating at a lower pressure and at a slow tempo to permit cooling before removal of the load. The two autoclaves in the department are of the fully automatic high-vacuum high-pressure type, using a sterilizing temperature of 273° F. (134° C.) and having a total operating cycle of 20 and 35 minutes (the latter to be shortened by fitting a better vacuum pump). Those who still believe that rubber gloves can only be autoclaved at low pressures should take note of the repeated statement that they withstand this high temperature well. These instruments and two electric hot-air ovens sterilize everything, and no sterilizing equipment remains in the wards: it is mentioned that 22 boiling-water sterilizers have been discarded, with a saving on maintenance and equipment and a gain in efficiency.

It is perhaps preaching to the converted to point out the advantages of such a department for the supply of syringes, because many syringe services already exist. Dr. Allison describes the processes of cleaning by ultrasonic vibration, drying, lubrication, and packing which enable satisfactory dry sterile syringes to be provided in large numbers. It is nevertheless startling to read that fewer needles per week are now supplied to the whole hospital than were formerly used in one ward. Many readers will be on less familiar ground when the author comes to describing the various "packs" containing autoclaved materials and instruments for various purposes. Most of these are wrapped in a double layer of fabric: drums are not used at all. They are divided into theatre packs, among which there are five main and many subsidiary categories, and ward packs, among which there are no

[1] *Present Sterilizing Practice in Six Hospitals*, 1958, Nuffield Provincial Hospitals Trust, London.
[2] *Brit. med. J.*, 1958, **2**, 1582.

fewer than 70, although only 22 of these are for "sterile" procedures. Such a system is a complete safeguard against accidents which may result from the very imperfect methods of sterilization commonly used in wards, and it must also relieve ward staffs of a substantial amount of work. As Mr. Walpole S. Lewin and Dr. J. F. Davies remark (p. 763), the practice of "sterilizing" items on wards is as archaic as some hospital buildings. At Musgrave Park Hospital nurses are still taught about older methods of sterilization, and two nurses at a time are trained for a fortnight in the department itself. Such systems, already commonplace in America, will have eventually to be adopted in this country, and this description of our first full-scale unit of this kind will be very helpful in making clear both what it entails and what it can achieve.

WAS IT WORTH IT?

The result of the architectural competition for the new medical teaching centre for Wales was announced at the beginning of June. Forty firms of architects competed and they had about a year to complete the design. The instructions to the competing architects were very thorough and included schedules of accommodation which listed every room in the centre and the area required for each. There were five assessors—three architects and two doctors—and the first prize was £5,000.

Architectural competitions are traditionally one of the ways in which a young architect can make a name for himself. The classic instance of this is the competition for Liverpool Cathedral won by Sir Giles Gilbert Scott when he was in his twenties. It is questionable, however, whether a building as complicated in its requirements as a medical teaching centre is a fit subject for a competition. No matter how carefully written is the brief—and to write it carefully may take years—it is almost certain that the winning design will have to be revised in detail, if not in general form, before it can be built. The results of the Cardiff competition do not seem to have been received with unanimous confidence, and it is somewhat alarming that the *Architects Journal* felt bound to criticize the design adversely not on "style and appearance, on which tastes may well differ, but [on] performance and function."[1] The scheme is based on close physical juxtaposition of the medical school, specialist departments, and the wards, and this was one of the assessors' main demands. It seems unfortunate, however, that in order to achieve this the architects have planned rather an old-fashioned arrangement around four deep light-wells. While much of the accommodation is concentrated in multi-story blocks, the advantages of concentration—short communication routes and efficient mechanical transport and services—seem not to have been achieved. The main blocks, for example, are over 500 ft. (150 m.) long and are served by six dispersed groups of lifts.

The brief to the competitors had a number of curious details. For example, although a central sterile supply department was called for there were not only a separate sterilizing unit for the operating theatres, but sterilizing rooms were listed as requirements for all wards and out-patient departments. Wards of ten beds, four beds, and one bed were asked for, but only four single-bed wards in a ward-sister unit of thirty-two beds, which seems a very small percentage and not a very great improvement over what is often found in old hospitals. Although early ambulation is to be encouraged, extremely small day spaces were called for, far smaller than would meet the needs of the number of patients found by J. W. D. Goodall to be ambulant under an early ambulation regime.[2] The assessors have reported that they are well pleased and that "the fundamental concept of the scheme has been grasped."[3] Many architects are asking, however, whether the results are so brilliant that they have justified forty architect-years' work before the scheme even goes to the Ministry. The result seems to have been an expensive building which embodies many faults from the standpoint of the users of the hospital. And flexibility has been sacrificed to monumental mass.

[1] *Architects Journal*, 1960, **132**, 127.
[2] Goodall, J. W. D., *Lancet*, 1951, **1**, 43.
[3] *Architects Journal*, 1960, **131**, 825-827.

METRIC EQUIVALENTS

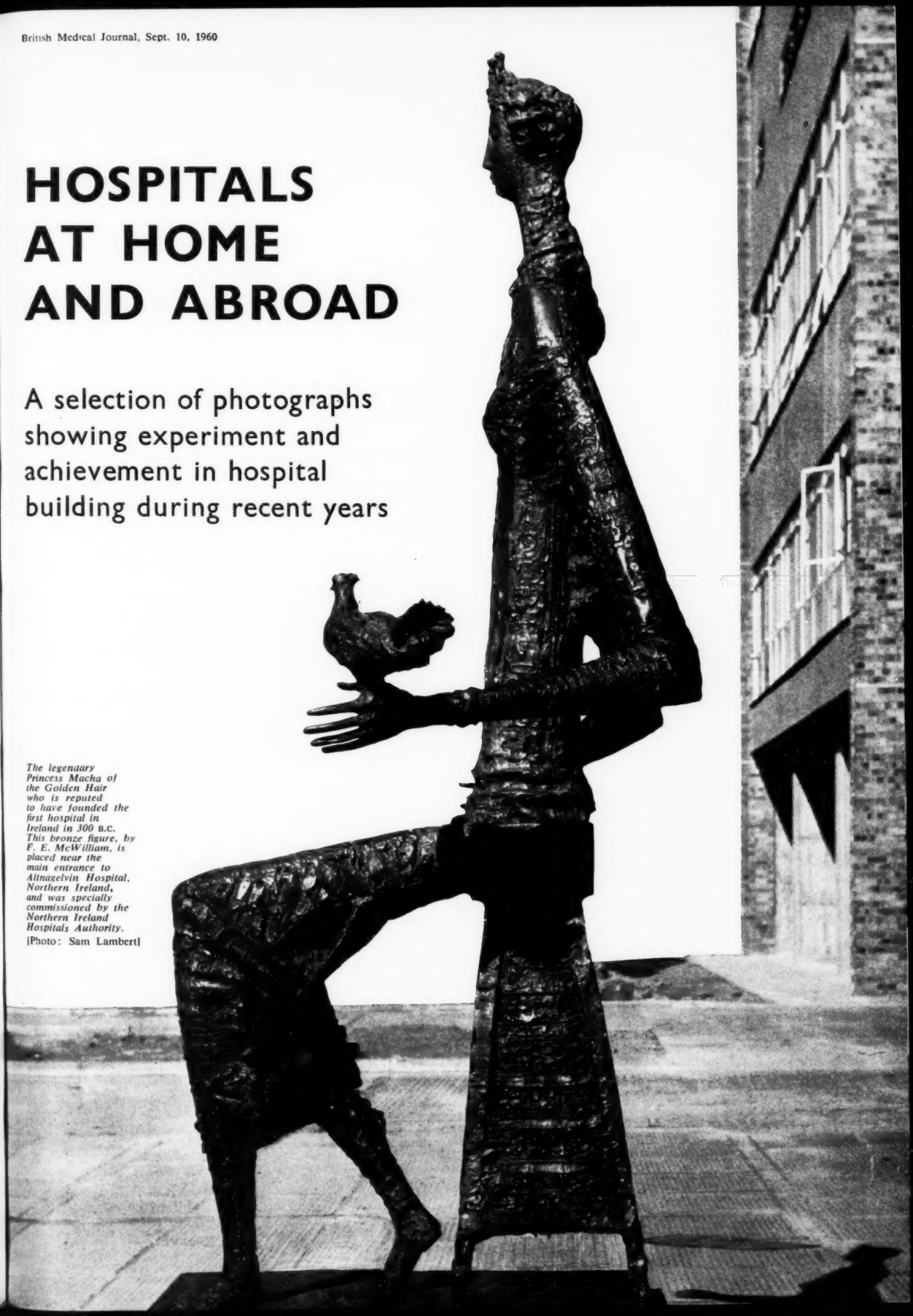
As long ago as 1908 the Representative Body of the B.M.A. approved in principle the adoption of the metric system for prescribing and dispensing. A statement from the British Pharmacopoeia Commission published at p. 796 this week announces another step towards replacement of the apothecaries system by the metric system. At present, if a doctor prescribes a drug in the units of the apothecaries system, the pharmacist must dispense it accordingly. What the Commission is now doing is to provide a conversion table which, if given legal force by a Parliamentary Act, will enable the pharmacist to convert the doctor's prescription for a tablet, capsule, or injection into approximately equivalent metric units and dispense it in those units. This proposal has the support of the Councils of the B.M.A. and the Pharmaceutical Society.

Apart from the growing inclination to measure drugs, especially new ones, in metric units, a fresh impulse to do so will come from the General Medical Council in 1963. Then the new edition of the *British Pharmacopoeia* will come out, and the G.M.C. has "accepted a recommendation from the Commission that steps should be taken to enable the apothecaries system to be abandoned" in that edition. Presumably the authors of the *B.P.* will take these steps. Thus the present conversion table, though imposing an extra obligation on pharmacists, would be a helping hand to medical men struggling from the present mixture of systems to the single system that seems bound to prevail in a few years. And its use should go far to prevent the difficulties that older doctors in particular must feel in the transition, to which the B.M.A. has drawn attention.[1] Since January, 1946, this journal has given the metric equivalents of all units in the apothecaries and other British systems in an endeavour to bring understanding to its readers abroad and encouragement to its readers at home.

[1] *Report of the Committee on Weights and Measures Legislation*, p. 23. H.M.S.O. 1951.

HOSPITALS AT HOME AND ABROAD

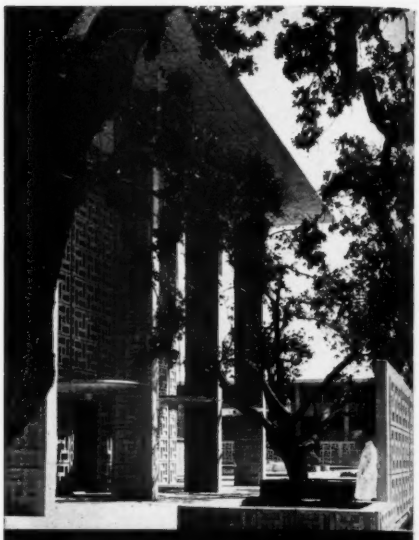
A selection of photographs showing experiment and achievement in hospital building during recent years



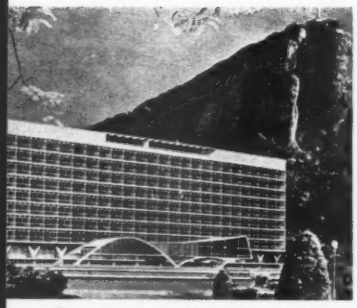
The legendary Princess Macha of the Golden Hair who is reputed to have founded the first hospital in Ireland in 300 B.C. This bronze figure, by F. E. McWilliam, is placed near the main entrance to Altnagelvin Hospital, Northern Ireland, and was specially commissioned by the Northern Ireland Hospitals Authority. [Photo: Sam Lambert]

Mexico City's new £11¼m. medical centre comprising 13 buildings with 2,073 beds. When it is completed nearly 4,000 people will work at or attend the centre. Medical Planning: Dr. M. S. Mallén. Architects: Enrique Yañez and Jorge Medellin. [Photo: Estudios y Proyectos, A.C.]

THE AMERICAS

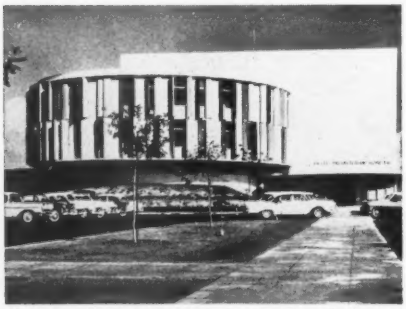


The new $22m. Stanford Medical Center, at Palo Alto, California, which is being dedicated on September 17 and 18, houses the Stanford University School of Medicine—four medical and three hospital buildings inter-connected by arcades and covered ways. The Center, with its 434-bed hospital, is designed around reflecting pools and fountains, trees, flower-beds, open courtyards, and patios.

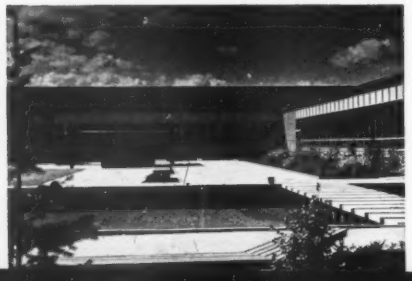


Hospital sul America, Rio de Janeiro, Brazil (1956). A 280-bed hospital whose wards overlook Lake Rodrigo.

Cantilevered balconies with a wide view at the Maimonides Health Centre, San Francisco, California, U.S.A. (1950). A nine-story monolithic building in concrete specially designed to resist earthquakes. Architect: E. Mendelsohn.



Valley Presbyterian Hospital, Los Angeles, California, U.S.A. An experimental circular wing in which the patients' rooms are grouped round a central service core. The windows can be shaded with aluminium shutters. Architects: Pereira and Luckman.

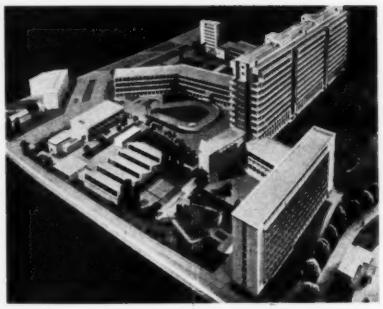


Workmen's Compensation Board Hospital and Rehabilitation Centre, Downsview, Canada. Interior court and pool. Architects: Page and Steele, Thomas R. Wiley. [Photo: Brian Shawcroft]

Central Institute Hospital Antonio Candido de Camargo, São Paulo, Brazil (1953). Because of its altitude São Paulo is rarely very hot, and this cancer hospital for 214 patients is built to make the most of the sun. Architects: Rino Levi and Roberto Cergueira Cesar.

Sahlgren Hospital, Gothenburg, Sweden (1959). Sweden's largest hospital—2,000 beds—whose recent 10-year rebuilding scheme has cost nearly £7m. The clinical and in-patient departments call for a staff of 3,000. Architects: G. Birch-Lindgren and E. Lohk.
[Photo: Änggårdens Yrkesskolor]

EUROPE



Dijkzigt Hospital, Rotterdam, Holland. A model of this hospital, now being built, shows a 13-story main block, a four-story wing for medical services and administration, and a nine-story nurses' home linked to the main block. Designed by A. Vierever and work continued after his death by the Rotterdam Public Works Department's chief architect and chief engineer.
[Photo: Openbare Werken, Rotterdam]

Copenhagen County Hospital, Glostrup, Denmark (1953). At present the hospital holds about 800 beds, and when fully developed will include a children's hospital. All the buildings are connected by a tunnel system, which also links up with the State Mental Hospital being built to the north. The Finnish architects were the winners of an inter-Scandinavian competition to design the Glostrup hospital. Architects: Ragnar and Martta Ypyä, and Veikko Malmio.

St. Lô Hospital, France (1956). Jointly financed by the U.S.A. and France, this 400-bed hospital is a memorial to American soldiers killed during the liberation of France, and was planned in accordance with the findings of the U.S. Public Health Service. Architects: Paul Nelson (U.S.A.) in association with R. Gilbert, M. Mersier, and C. Sebillotte.

Hospital at Renaix, Belgium (1955). Architect: R. Delgutte.

Juliana Hospital, Terneuzen, Holland (1954). This hospital for 146 patients, costing about £532,000, and built on an H plan, has been designed with future expansion in mind. Architect: J. P. Kloos.

municipal hospital **BASLE** switzerland

This 671-bed hospital is the only general hospital—apart from the Söder Hospital, Sweden—to be built in Europe during the last war. Planning started in the late thirties and the first stage was completed in 1945. This consists of an eight-story ward block, with a parallel, three-story block for the medical services on the north side.

Architects: E. and P. Vischer, H. Baur, Bräuning Leu Dürig.

The hospital from the north side.

The entrance hall.

Balcony terrace overlooking the city.

[Photo: R. Spreng, Basle]

An operating theatre seen from one of the sterilizing rooms between the theatres.

[Photo: R. Spreng, Basle]

A double room for nurses overlooking the gardens.

[Photo: Peter Heman, Basle]

A six-bed male surgical ward. Special corridors and lifts enable food to be served within four minutes of leaving the main kitchen.

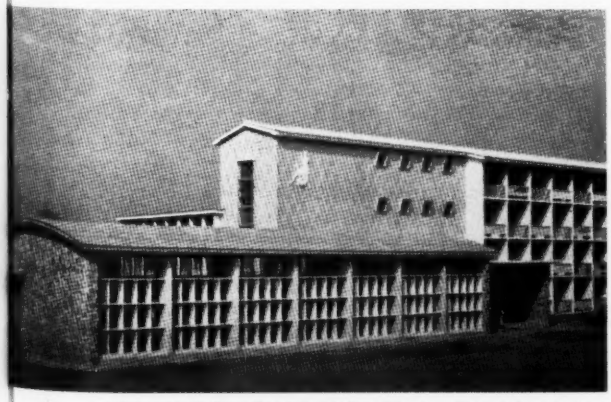
[Photo: Peter Heman, Basle]

AFRICA, MIDDLE AND FAR EAST

Kumasi Hospital, Ghana (1955). A 500-bed general hospital and nurses' training centre. The model shows how the ward blocks are grouped in echelons to allow as much air as possible to reach the wards. The building is decorated with Ashanti patterns and colour is used extensively. Architect: A. G. Paton.

Queen Elizabeth Hospital, Adelaide, South Australia. This 486-bed hospital, costing £A.7m., was opened by Queen Elizabeth, the Queen Mother, in 1958. It is the first hospital in Australia to bear the name of Queen Elizabeth, and was named by H.M. the Queen by Special Proclamation in 1954. It is South Australia's second large teaching hospital, and contains a general and a maternity section. The building shown here is the main block of the general hospital. Architects: E. Caradoc Ashton, in association with Messrs. Stephenson and Turner.

Yosef Meier Memorial Hospital, Kfar Seba, Israel (1956). A 400-bed hospital for tuberculosis patients. The ward units are in the main block, and the administrative and medical services in the lower one. Architects: Z. Rechter and Partners.



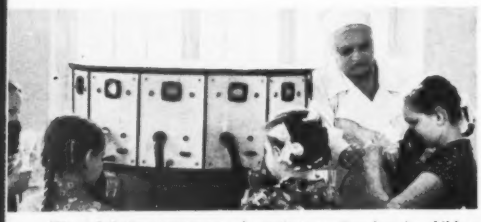
University College Hospital, Ibadan, Nigeria. This student hostel is part of Nigeria's first teaching hospital, the building of which started towards the end of 1953. Architect for hostel: Public Works Department, Federation of Nigeria. Chief architect, George Stout.

National Railways Hospital, Moli, Japan. The wards are in the main block, the treatment wing at right angles. Architects: Department of Japanese Railways.

A hospital in Moscow. [Photo: D. Kozlov]

IN RUSSIA

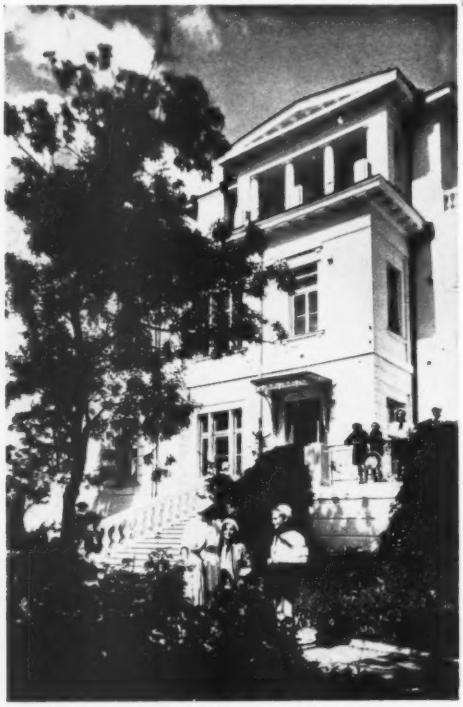
Photos by courtesy of Soviet Weekly



The inhalation treatment of respiratory disorders in children at the Saratov Medical Institute.

Professor Nikolai Zakharov operating at Saratov Children's Surgery Clinic.

A child being given a dose of live poliomyelitis vaccine at a children's polyclinic, Shukovsky, Moscow Region. [Photo: V. Koshevoi]



A children's sanatorium in Yevpatoria, the Crimea, Ukrainian S.S.R. [Photo: E. Tikhanov]

Professor B. A. Petrov injecting a spinal analgesic at the Sklifasovsky Institute. [Photo: L. Porter and M. Redkin]

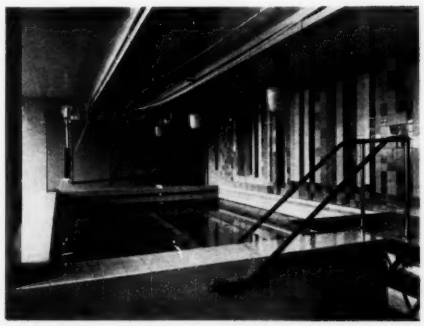
Altnagelvin Hospital, Londonderry, Northern Ireland

A children's ward. [Nursing Mirror]

Altnagelvin Hospital—started in 1951 and opened in 1960—is the first completely new hospital to be finished in the United Kingdom since the war, and, as *The Architect's Journal* points out, though it was designed before the Nuffield Foundation's researches were available "it nevertheless provides a very valuable yardstick for future developments in hospital planning and organization." Costing over £2½m., the hospital is designed for 394 patients, but could be extended later on to 600 beds. At the moment the main building is L shaped, with an 11-story ward wing, which includes a maternity and a paediatric department, an eight-story treatment wing running at right angles to it, and a single-story out-patients' wing attached. An underground service corridor links the main block with the kitchen, stores, and service buildings, which stand well away from the hospital building itself. (Photos: Sam Lambert).

Architects: Yorke, Rosenberg, & Mardall.

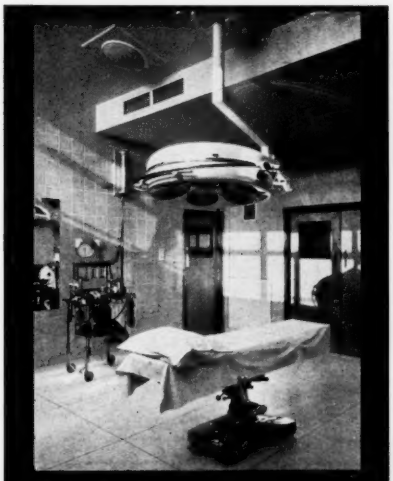
Central Sterile Supply Department.



Hydrotherapy pool, the rear wall of which is decorated with a tiled mural by Paul Feiler.

Part of the kitchen.

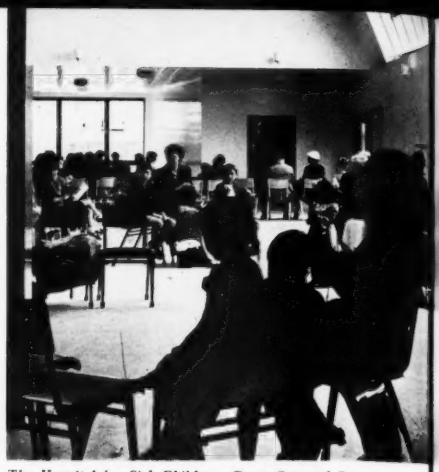
Staff dining-room.



An operating theatre.

[Photo: Sam Lambert]

LOUNGES WAITING AND RECEPTION ROOMS



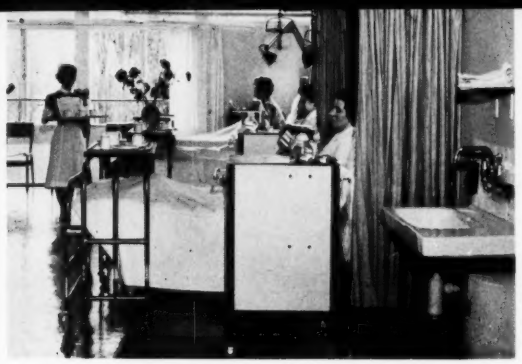
The Hospital for Sick Children, Great Ormond Street, London. Architects: Easton and Robertson.
[Photo: Chris Ware. Keystone Press]

St. James' Hospital, Balham, London. Architects: Devereux and Davies.
[Photo: J. R. Pantlin]

San Bernardino Medical Group, California, U.S.A. Architect: R. J. Neutra.
[Photo: Julius Shulman]

Manchester Royal Infirmary.
[Photo: Manchester Evening News]

Thurg.-Schaffhausen Heilstätte, Davos. Architects: Krähenbühl and Bühler.
[Photo: Furter Davos-platz]



Six-bed ward, Musgrave Park Hospital, Belfast. Architects: R. Llewelyn Davies and John Weeks.

[Nursing Times]

Typical ward, Exeter City Hospital Maternity Unit. Architect: K. W. F. Harris.

[Photo: Chandlers, Exeter]

WARDS

Ward balcony, Valbella Sanatorium, Davos. Architects: Krähenbühl and Bühler.

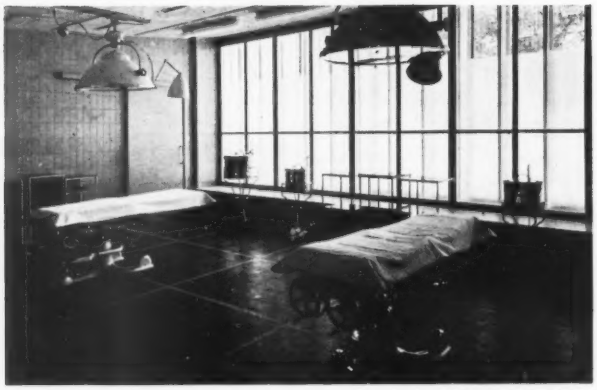
Eight-bed ward, Kantonsspital, Zurich. Architekten Gemeinschaft Akz: R. Steiger, H. Fietz, M. E. Haefeli, H. Weideli, J. Schutz, W. M. Moser.

[Photo: Hochbauamt des Kantons]

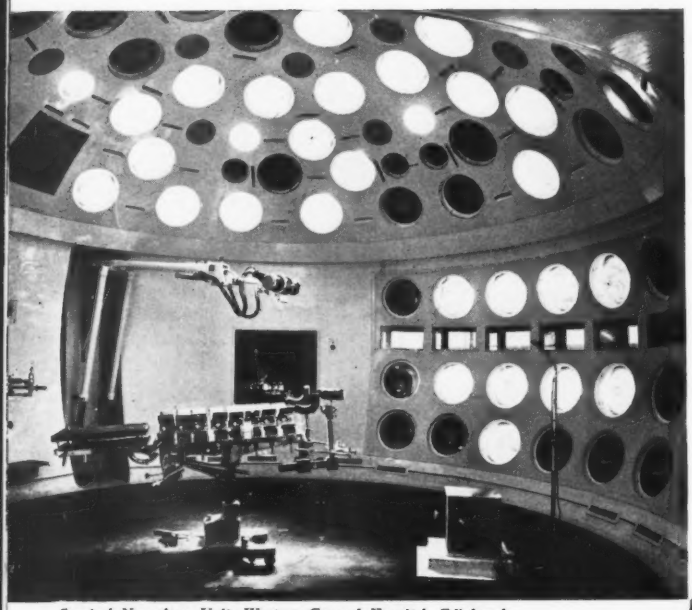
Ward with observation panel, Hutt Hospital, New Zealand.

[By courtesy of the High Commissioner for New Zealand]

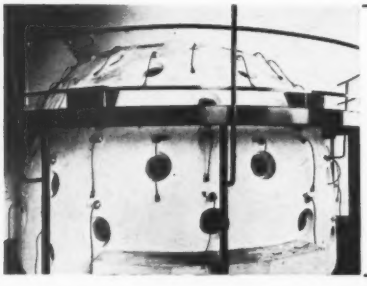
OPERATING THEATRES



Kantonsspital, Zurich.
[Photo: Hochbauamt des Kantons]



Surgical Neurology Unit, Western General Hospital, Edinburgh.
One of the two operating theatres. The air is changed 21 times an hour. The ceiling is an egg-shaped, pressurized dome with operating lights 10 times as powerful as normal theatre lights, ventilation grilles, and viewing-ports. It is also equipped with a five-way radiographic viewing-box, a magnetic lighting-control panel, oxygen, nitrous-oxide suction, nitrogen for compression tools, E.E.G. connexions, and television for the transmission of encephalographic recordings. Architect: John Holt.
[Photo: Alistair Hunter]

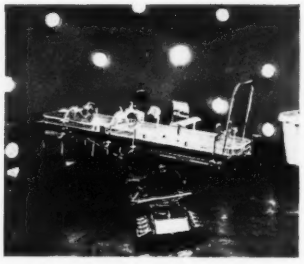


Interior of operating theatre, Copenhagen County Hospital, Glostrup, Denmark, and exterior, showing students' viewing galleries. (Electrical installations incomplete.)

Architects: Ragnar and Martta Ypyä, and Veikko Malmio.

Nuffield House, Musgrave Park Hospital, Belfast.
Architects: R. Llewelyn Davies and John Weeks.
[Nursing Times]

Vale of Leven Hospital, Scotland. Architect: J. L. Gleave (Keppie, Henderson, and Gleave.)
[Photo: T.



St. Lô Memorial Hospital. The operating table is mounted on a rail and can be moved between two units holding all necessary instruments and connexions. Air is renewed 12 times an hour.
[Photo: USIS, Paris]

Hydrotherapy pool, St. James' Hospital, Balham, London.
Architects: Devereux and Davies.
[Photo: J. R. Pantlin]

SOME HOSPITAL INTERIORS

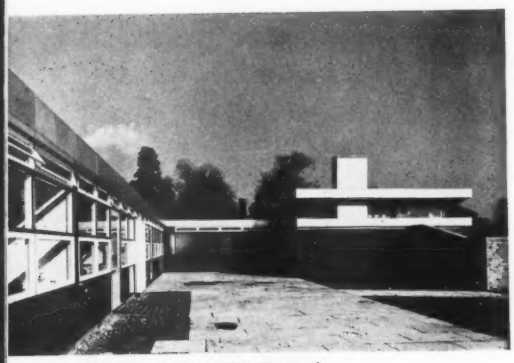
Patient's day room, Vale of Leven Hospital, Scotland.
Architect: J. L. Gleave (Keppie, Henderson, and Gleave.)
[Architects' Journal]

A nurse's room, Thurg.-Schaffhausen Heilstatte, Davos.
Architects: Krähenbühl and Bühler.
[Photo: Otto Furter, Davos-platz]

Physician's consulting-room, Beckstrand Cancer Clinic, Long Beach, California, U.S.A.
Architect: R. J. Neutra.
[Photo: Julius Shulman]

Pharmacy, Greater Bakersfield Memorial Hospital, California, U.S.A.
[Photo: Phil Fein and Associates]

THE MODERN MENTAL HOSPITAL



The paved area outside the wards.

A covered way.

Exterior views of the George Schuster Admission Unit (1955) attached to the nineteenth-century Fairmile Hospital at Wallingford. The unit is for 53 patients of both sexes, and treatment is also carried out there.

Architects: Powell and Moya.

A detail of the roof.

Interior views of the £100,000 extension to the Glasgow Royal Mental Hospital at Gartnavel, which was opened this year and has accommodation for 80 patients. Architects: Burnet and Glasgow, in conjunction with the architects' department, Western Regional Hospital Board.

Day lounge.

Patients' washrooms and lavatories.

A six-bed ward.

ACKNOWLEDGEMENTS

We are very grateful for the help and advice given and for the photographs made available to us by various organizations, including the hospitals and architects concerned, the Architectural Press, the International Hospital Federation, the Ministry of Health, the *Nursing Mirror*, the *Nursing Times*, the Nuffield Foundation's division for architectural studies, the Royal Institute of British Architects, the Soviet Embassy, and the *Soviet Weekly*. We particularly appreciate the unstinted help given by the Cement and Concrete Association.

PSYCHIATRIC SERVICES FOR CHILDREN

REPORT OF THE BRITISH PAEDIATRIC ASSOCIATION*

Facilities for the assessment and management of psychiatric disorders in children and adolescents are generally admitted to be inadequate, but the extent of this deficiency as it is felt by paediatricians had not been estimated. Accordingly in 1957 the B.P.A. invited all paediatricians in the United Kingdom to answer a questionary, designed to obtain detailed information as well as general observations, on the psychiatric services for children from the paediatrician's viewpoint. It was left open to individuals to consult psychiatric colleagues and local authorities before replying.

The views of some two-thirds of all practising paediatricians were obtained; but a statistical analysis of details was not thought to be warranted, because of variables in the replies. Many replies were composite, representing large or small groups of paediatricians; some degree of overlap was apparent; and individual methods of obtaining and setting out the information sometimes differed.

Psychiatric Facilities in Different Age-groups

The psychological problems of adolescents are dealt with by the general paediatric and adult services, and specialized facilities devoted exclusively to adolescents are almost non-existent.

Regrettably little information was available about children of pre-school age or on the important aspect of preventive mental health work, which would be expected to have its greatest scope in infant-welfare centres and similar establishments mainly under the control of local authorities. It is therefore impossible, from the information received, to assess the adequacy of services for the youngest children.

The remainder of this report deals with children, excluding these two age-groups.

Facilities for Children

The need for new or additional psychiatric facilities for children was expressed by the majority of paediatricians. This applies to most areas, from the largest (including teaching centres) to the smallest. Two-thirds of those who answered the questionary, whether in cities with medical schools or in other centres, considered that better out-patient facilities and increased staff were needed; the remaining one-third were doubtful or did not state their views. Of those who replied, half of the paediatricians in cities with a medical school, and one-quarter of those elsewhere, expressed a need for more in-patient accommodation and staff, while the rest were doubtful or did not comment. Slightly more than one-third of the paediatricians who replied, wherever they worked, thought that paediatric–psychiatric liaison was adequate, less than one-third thought it was inadequate, and the remainder were doubtful.

In some areas "facilities are so inadequate that any improvement would be welcome" and "anything to help would be welcome" (to quote from two replies). There are some rural districts where special facilities simply do not exist. Areas in which facilities are considered by the paediatrician to be completely adequate are exceptional. The majority of areas, while falling between the two extremes, are nearer the lower end of the scale. From only one area was there a stated objection to the extension of existing facilities.

Personnel

The shortage of facilities applies in a marked degree to personnel. It is clear that paediatricians are dealing with many children who have psychiatric problems—not only those referred with bodily symptoms but also many with frank emotional and behaviour disorders. Some paediatricians admit a lack of expertise and ask for opportunities of improving their knowledge and skill in this field.

There is a widely expressed need for more psychiatrists and particularly for those with special training in children's disorders, in which the only available psychiatrist is sometimes deficient. A need is also expressed, though to a less extent, for psychologists and psychiatric social workers.

Liaison between paediatricians and psychiatrists (where these are available) is fairly adequate, but is inhibited by the already full (or over full) commitments of consultants in both groups and often by the circumstance that they work in separate buildings. It is arguable in which group of consultants the need for expansion is the more urgent.

Out-patient Facilities for Child Psychiatry

Great emphasis was laid on the shortage of out-patient services, which are widely and often grossly deficient. Waiting-lists are long even where staffing is not stated to be inadequate. In one district the waiting period for appointments is two and a half years.

In-patient Facilities

Additional in-patient facilities are requested in many areas, particularly in the larger centres. Beds in general paediatric departments are often available to, and are occasionally used by, psychiatrists for their cases; but the extent and usefulness of this facility need clarification. The admission of such cases to paediatric wards appears to be of value for the observation and diagnosis (and possibly management) of milder and less-disturbing disorders; but for severe cases, and as a rule for treatment, it appears to be unsatisfactory for various cogent reasons.

Under the heading of accommodation, other important issues call for comment: first, the extreme deficiency of in-patient psychiatric services with consultant paediatric co-operation; and, second, the extent to which accommodation in hostels (and similar institutions) is used, with the deplorable effect of removing cases from the medical field.

Comments

While the need and urgency for additional facilities are generally evident, methods of attempting to meet them—except by forlorn and usually unsuccessful applications for further psychiatrist appointments—are few. Experiments already carried out in a few centres might well be emulated. Examples of these are: joint paediatric–psychiatric clinics; regular rounds and case conferences at consultant level; a paediatrician working

*This report was drawn up by the Standing Committee on Mental Health of the British Paediatric Association. In obtaining the information on which it was based, and in its preparation, the following have contributed: Dr. J. Apley, Dr. Mildred Creak, Professor D. V. Hubble, Dr. D. MacCarthy, Dr. R. MacKeith, Dr. R. Mayon-White, Professor A. A. Moncrieff, and Dr. C. T. Potter.

directly with a psychiatric social worker; and part-time seconding of paediatric registrars to psychiatric clinics.

In addition, suggestions made for the future include the following: arranging courses in child psychiatry for paediatric consultants and registrars; the training of paediatric registrars with a view to practising in child psychiatry; the formation of mobile psychiatric teams based on large centres and visiting outlying areas; the co-ordination of paediatric–psychiatric activities (routine, teaching, and research) on the basis of regional units; and the increased use of adjoining premises (preferably in children's hospitals) for paediatric and psychiatric services.

These measures, however, are likely to touch only the fringe of the problem. The role and responsibilities of paediatricians in the mental field call for further exploration and clarification. At the present time, in our view, the basic needs for correcting outstanding deficiencies in the psychiatric services for children are an increase in the time devoted to mental health and disease throughout the medical student's curriculum; a considerable, planned expansion both in paediatric and in psychiatric personnel; and an integration of the services they render to children.

ABANDONMENT OF THE APOTHECARIES SYSTEM

The following statement has been issued by the British Pharmacopoeia Commission:

In 1950 the Committee on Weights and Measures Legislation submitted to the President of the Board of Trade a report which included among its recommendations the following:

"The apothecaries, troy, and pennyweights systems of measurement should be abolished after five years and the trades and professions using them should adopt in their place the metric system."

The report records that "For many years past, both the British Pharmacopoeia Commission and the Pharmaceutical Society have advocated that the medical and pharmaceutical professions should work in the metric system only," and that "The British Medical Association has said that the medical profession is probably in favour of using the metric system but that, so far as prescribing is concerned, abolition of the use of the apothecaries system would cause what would almost amount to hardship in the middle and older generations of doctors."

In 1955 the General Medical Council accepted a recommendation from the Commission that steps should be taken to enable the apothecaries system to be abandoned in the edition of the *British Pharmacopoeia* intended for publication in 1963. The current edition of the *Pharmacopoeia* employs the metric system except (*a*) in the statement of dose of the older drugs, for which both apothecaries and metric quantities are given, and (*b*) in statements concerning the strength of certain preparations, such as tablets, capsules, and injections, of the older drugs. Almost all drugs and preparations introduced into the *Pharmacopoeia* during the last ten years are referred to in the metric system only. Less than 20% of the tablets of the *Pharmacopoeia* have their strength expressed in the apothecaries system. In considering the manner in which the apothecaries system might be abandoned the Commission held meetings with a number of interested organizations, and the following important points emerged.

1. Whilst the replacement of the apothecaries system by the metric system in certain liquid medicines would raise complicated problems, the abandonment of the apothecaries system in relation to many official dosage-form preparations offered an attractive first step.

2. If the metric system is adopted in expressing the strength of dosage-form preparations (tablets, capsules, and injections) of the *Pharmacopoeia*, it should at the same time be adopted for similar preparations described in the *British Pharmaceutical Codex* and the *British National Formulary*.

3. In order to abolish the use of the apothecaries system for tablets, capsules, and injections of the *B.P.*, *B.P.C.*, and *B.N.F.*, it will be necessary to stipulate: (*a*) the strength in metric units which *must* be dispensed or supplied in the absence of directions on the prescription or order: (*b*) the strength in metric units which *must* be dispensed or supplied when a strength in apothecaries units is stated on the prescription or order.

4. Legislation would be necessary in order to adopt 3(*b*).

Proposed Schedule of Equivalents

The Commission explored the possibility of a Parliamentary Bill intended to authorize the use of the metric system in this way, and outlined a proposed measure which was placed before the British Medical Association and the Pharmaceutical Society. The Councils of the Association and the Society have endorsed the proposal by the adoption of the following recommendation:

"That the Councils of the British Medical Association and the Pharmaceutical Society assist in sponsoring or supporting legislation to secure that when tablets, capsules (and other named dosage forms) described in the *British Pharmacopoeia*, *British National Formulary*, and *British Pharmaceutical Codex* are prescribed or demanded with the strength stated in the apothecaries system, the equivalent metric strength stated in the Schedule to the Bill must be dispensed or supplied."

The Schedule proposed by the Commission is shown in the Table.

*Schedule of Apothecaries and Metric Quantities**

Grains	Milligrams (mg.)	Grains	Milligrams (mg.)	Grains	Milligrams (mg.)
10	600	¼	15	1/75	0·8
7½	450	1·5	12·5	1/100	0·6
5	300	1·6	10	1/120	0·5
4	250	1·8	7·5	1/130	
3	200	1/10	6	1/150	0·4
2½	150	1/12	5	1/160	
2	125	1/15	4	1/200	0·3
1½	100	1/20	3	1/240	0·25
1	60	1/25	2·5	1/300	0·2
¾	50	1/30	2	1/320	
½	30	1/40	1·5	1/480	0·125
2/5	25	1/50	1·25	1/600	0·1
1/3	20	1/60	1		

*This table has been compiled with regard to the strengths of tablets, capsules, and injections described in the *British Pharmacopoeia*. The intention is that when a tablet, capsule, or injection is prescribed or demanded with the strength stated by weight as one of the apothecaries quantities given in the left-hand columns, tablets, capsules, or an injection containing the corresponding metric quantity given in the right-hand columns must be dispensed or supplied.

The following points should be noted in connexion with the proposals.

1. This is a partial abandonment of the apothecaries system and applies only to certain named dosage-forms of drugs included in the *British Pharmacopoeia*, *British Pharmaceutical Codex*, and *British National Formulary*.

2. It would be necessary to provide an interim period adequate for the disposal of stocks of preparations made according to the apothecaries system.

3. When the change became fully effective it would not be necessary for pharmacists to hold stocks of the preparations concerned which had been made according to the apothecaries system.

4. Whilst it is expected that the prescribing of these preparations in the metric system will increase, the prescriber would remain free to use the apothecaries system.

5. The pharmacist would be provided, by means of the Schedule, with a clear statement of the strength by weight in metric units which must be supplied when the *B.P.*, *B.P.C.*, and *B.N.F.* preparations concerned are prescribed or demanded in the apothecaries system.

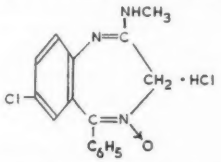
To-day's Drugs

With the help of expert contributors we publish below notes on a selection of drugs in current use.

Methaminodiazepoxide

"Librium" (Roche Products).

Chemistry.—This drug, which has the chemical name 7-chloro-2-methylamino-5-phenyl-3H-1, 4-benzodiazapine-4-oxide hydrochloride, is not related to other tranquillizing or antidepressant drugs. Its structural formula is as follows:



Pharmacology.—In experiments on aggressive wild animals methaminodiazepoxide has been shown to exert a sedative action, quietening them in doses low enough not to affect their general activity. It is an anticonvulsant and muscle relaxant, does not induce hypnosis, and stimulates appetite. Such paradoxical reactions also occur with reserpine and phenothiazines, but, unlike these drugs, librium does not cause extrapyramidal complications, and its mechanism of action is probably different. Its site of action may be the reticular system and its hypothalamic connexions.

Therapy.—The main use of librium so far has been in the treatment of neurotic conditions accompanied by anxiety and tension. Phobic anxiety states, even when long-standing, may respond well. Librium is also reported to have been effective in some reactive types of depression, particularly when tension is present. Other states of depression may respond rapidly to a combination of librium and a monoamine oxidase inhibitor. However, the agitation that may occur in endogenous depression is better treated with a phenothiazine (in addition to E.C.T.), since librium may increase agitation. Claims are made that librium benefits obsessional neuroses, but in some patients obsessional symptoms and tension have been made worse by the drug. It is said to be useful in the treatment of addiction to alcohol, abolishing tension and depression in the withdrawal phase, while aggressive psychopaths are reported to have been considerably improved in behaviour. More experience is needed before a just appreciation of these claims can be formed. There appears to be no place for librium in the treatment of schizophrenia.

The usual starting dose is 10 mg. (1 capsule) t.d.s., but elderly patients should start with less. Therapeutic effects occur quickly, usually within 24 hours.

Side-effects.—These are directly related to the dosage, and become frequent when more than 60 mg. a day is given. The drug seems to be cumulative. Drowsiness and ataxia are the most common side-effects, but disappear when the dosage is reduced. Constipation, rashes, nausea, frequency of micturition, loss of libido, and headaches occasionally occur. Pruritus has been reported, but librium has sometimes been effective in the treatment of this symptom. Hypotension does not seem to occur.

N.H.S. Basic Price.—100 10-mg. capsules for 25s.

A new laboratory costing £A.150,000 is to be built at Melbourne University as the result of an offer by a group of leading businessmen. They have promised to underwrite the cost of the new laboratory, which will be used to further investigations into heart, liver, and kidney diseases. (Radio Australia News.)

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Treatment of Leprosy

SIR,—In these days of rapidly expanding intercourse between the various components of the British Commonwealth and Great Britain, fresh cases of leprosy first diagnosed in this country are not rare. We should all be grateful for your excellent editorial on the modern treatment of leprosy (August 27, p. 655).

There is one aspect of this subject which is proving unexpectedly disappointing—namely, the ophthalmic manifestations of the disease. At the Hospital for Tropical Diseases, London, I have observed a number of lepromatous cases who to begin with, before treatment, had normal eyes. These patients always have their eyes examined every few months, and it has been discouraging to observe the development of the classical stigmata of ocular leprosy (punctate keratitis, iris lepromata, and later peripheral choroido-retinal changes)—a full account of which is given in Cochrane's *Leprosy in Theory and Practice*[1]—although they have been having the best of modern leprosy therapy. The eye signs often progress even though there is evidence of control and gradual elimination of the disease elsewhere in the body.

Presumably these drugs are not penetrating the ocular tissues, and we have tried unsuccessfully to bring them to the eye in higher concentration by means of drops, ointment, and subconjunctival injection.

Fortunately the vision is not seriously affected until the ocular leprosy is very advanced, but ultimately blindness does result, usually from destruction of the ciliary body by the bacilli. It thus appears likely that, although modern drug treatment will keep even the most heavily infected patients going for much longer than would otherwise be the case, this is only achieved at the cost of increasing the likelihood of blindness before they die. Consideration of the ocular complications should therefore be included when new methods of treatment in leprosy are being assessed.—I am, etc.,

Hospital for Tropical Diseases, London N.W.1. D. P. CHOYCE.

REFERENCE

[1] Cochrane, R. G., *Leprosy in Theory and Practice*, 1959, John Wright, Bristol.

Health at Work

SIR,—I have read with interest the article "Industrial Hygiene Laboratory Service" by Dr. R. S. F. Schilling, Miss Jane Cooper, and Dr. P. A. B. Raffle (*Supplement*, July 16, p. 35) and your leading article "Health at Work" (August 6, p. 445). The Industrial Health Advisory Committee appointed a subcommittee to "collect and assess information as to the need for more chemical, physical, and biological testing in factories, with a view to reducing the risks of injury to the health of the workers." Dr. Schilling and his colleagues have shown the need for tests of this nature in industry, and in their summary state, "In each of the three groups of tests, the majority of the medical officers wanting help said they would have used an industrial hygiene laboratory if one had been available." It is upon the last sentence that I wish to comment.

The three groups of tests mentioned are chemical, physical, and biological. Chemical and physical tests applied to the industrial environment lie within the province of industrial hygiene. Biological testing does not—blood and urine tests are part of clinical pathology (experimental pathology may also be involved); audiometry, radiology, and suchlike fall within the compass of clinical medicine. Industrial hygiene, concerning itself with the working environment in relation to health, is normally done by an industrial hygienist who may be an engineer or chemist. To suggest that biological testing, which can only be done, or at least interpreted, by medically trained persons, is part of industrial hygiene, means that the industrial hygienist must employ physicians working under him. The industrial hygienist is, in fact, a part of the industrial physician's team, and it is the latter who correlates the findings of the hygienist with those of the pathologist and clinician.

If it is accepted that industrial hygiene means the assessment of the environment in relation to health, the provision of an industrial hygiene laboratory service is only half the answer to its achievement. The greater part of industrial hygiene is field work, and very many tests and measurements are made by direct-reading instruments on the spot. Even those that require a laboratory analysis usually need appreciable skill in collection of the sample. A further non-laboratory aspect of the work is the study of plans and designs for new equipment or modification of existing plant. What is needed is an industrial hygiene service and not just an industrial hygiene laboratory service. Biological testing does not lie within the sphere of industrial hygiene and should be organized separately.

If the desire is to provide the much-needed assessment of the working environment, let us talk about providing an industrial hygiene service. If, however, the desire is to provide pathology, radiology, audiometry, and suchlike for industry as well, let us talk about the provision of full occupational medical services, one answer to which might be the establishment of group occupational medical centres or polyclinics having all these facilities.—I am, etc.,

Reigate, Surrey. ERNEST H. CAPEL.

SIR,—Drs. J. A. Harrington and W. Mayer-Gross do well to call attention (August 27, p. 669) to the tremendous scope which exists for preventive mental health work in industry. Toxic hazards affect comparatively few workers, and the slum factory is becoming steadily less common; but problems of mental health are universal, not only in industrial establishments but also in shops and offices, whose need it is all too easy to overlook. This fact would justify a nation-wide occupational health service on economic grounds alone even if physical hazards and industrial diseases were completely eliminated.

The present mental health services suffer from the major defect that they do not begin to operate until the illness is well advanced. The industrial medical officer is in a position to detect the earliest signs—often before the family doctor, who will not be consulted by the average patient until the symptoms have assumed fairly serious dimensions. A good deal of elementary psychotherapy is already practised in the works surgery which represents the rudiments of a mental health "programme." But most industrial medical officers lack special training in psychiatry, and amateurism has both limitations and dangers. Hence, opportunities of consultation with psychiatric colleagues in the factory would be most welcome both on individual cases and on wider problems of community mental health. My own experience suggests that where attempts have been made to bridge the gap between industry and the mental health services, the initiative has come almost exclusively from the industrial side; one learns by chance that an employee is under psychiatric treatment, even when the job situation appears to be a major factor in the illness. In such circumstances one might expect the psychiatrist to inquire whether the firm has an industrial medical officer, and to seek his co-operation—yet I have never known this happen. Your correspondents' plea is therefore all the more welcome as evidence that some psychiatrists are aware of the need.

Until occupational health services have expanded to cover at least a majority of the employed population, we cannot expect any major advance on a national scale, but this need not preclude local experiments in collaboration on the lines suggested, from which valuable lessons might be learned.—I am, etc.,

Birmingham 3. F. H. TYRER.
Chief Medical Officer,
West Midlands Gas Board.

Deaths from Drowning

SIR,—The number of deaths from poliomyelitis in England and Wales in the five years 1954 to 1958 was 822. The number of deaths (accidental) from drowning in England and Wales in the same period was 4,489. These figures were supplied by the Registrar-General; they cover the last five years before a satisfactory vaccine was used extensively against poliomyelitis. It would seem logical to inquire whether or not much more could be done to prevent many of these deaths, as the large majority of drownings are probably due solely to an inability to swim quite a short distance.

Most people are capable of being taught to swim in a very few hours, and the logical time of life to learn is at school. I write at a time when many swimming-baths are about to have their plugs pulled, to be covered with planks for two school terms, and to be danced upon on the average, in some cases, once a week. This sounds like foolishness to me. I think that, if local authorities would see their baths as a place where a child may learn to save himself from drowning, as he is five times more likely to do so than he is to die from poliomyelitis if unvaccinated, they would be doing far more good. If, furthermore, a simple swimming-test could be rewarded by a certificate, nationally standardized and made attractive by the dubbing of a suitable title, that too might help.

I should welcome the opinions of anyone with suggestions on this problem.—I am, etc.,

Tipton, Staffs. F. W. WOODRUFF.

Child Psychiatry

SIR,—I was very much interested in Dr. A. K. Graf's letter (August 20, p. 600) in which he deplores that so few young doctors are prepared to devote themselves wholly to child psychiatry. Although there is now considerable evidence to show that correct management in childhood is the best form of prophylactic psychiatry, yet adequate recruits for this work are not available. The main reason for this is the fact that this separate specialty of child psychiatry should not exist any more than adult psychiatry, for the simple reason that children grow up into adults, and while they are children they

are in the care of adults. Moreover, adults are governed by the same basic motivation as children.

The split between adult and child psychiatry is quite unnecessary and damaging both to progress and to the proper education of trainee specialists. Adult psychiatry, having evolved from the mental hospital or the analyst's couch, has a completely different classification and theoretical attitude from child psychiatry, which has evolved from social work, paediatrics, and educational psychology. Accounts of these two branches of psychiatry usually seem like descriptions of two entirely different species. The time has come to bring together all psychiatry—or the study of human biology which it is—in the interest of logic and of our patients, and then young doctors will want to become recruits for this branch of medicine. I think that medical students and newly qualified men are able to see through the fallacy of this split-mind psychiatry and are unwilling to commit themselves to be child psychiatrists exclusively, especially as it often involves getting further training in order to qualify for a lower status.

I think this is one of the very few problems that can be solved by simple administrative action—namely, that most future consultant and senior registrar appointments in psychiatry should include work with both adults and children.—I am, etc.,

Hampstead General Hospital, London N.W.3. FELIX BROWN.

Psychiatrists on Hospital Boards

SIR,—In your issues of July 30 (p. 402) and August 6 (p. 477) you published the names of medical members of boards of governors of provincial teaching hospitals and regional hospital boards respectively. On the former the percentage of psychiatrists is, I estimate, something between 0 and 3, in the latter about 10.

I think this shows a serious position. The inadequate standard of teaching psychiatry to medical students and the poverty of provision of psychiatric beds in general hospitals are two of the bars to progress in the treatment of mental illness, and if provincial teaching hospitals have on their boards of governors no informed psychiatric opinion the position is not likely to improve.—I am, etc.,

Beaconsfield. J. B. S. LEWIS.

Mental Health Tribunals

SIR,—I have read the correspondence on this subject with interest, and up to a point I agree with Dr. F. E. Graham-Bonnalie (June 18, p. 1888). I think that it would be a pity if the Minister was to exclude all G.P.s from mental health tribunals, but by no means every family doctor is able, or indeed willing, to sit on such a body. Dr. S. Sharman (July 2, p. 67) has gone so far as to say that even every psychiatrist is not suitable for this type of work.

I have made inquiries locally and centrally and I can find no evidence to indicate that the Minister has in fact changed his mind. As a G.P. I was asked to sit on the local mental health tribunal, and, while so far I have not been asked to function on such a tribunal, I am assured that my services will still be needed. Any doctor who undertakes such work must have considerable experience in the subject, especially as regards psychoses. The paranoid case can be a real problem, and this is just the type of patient likely to be seen by the tribunal.—I am, etc.,

Ibstock, Leicestershire. C. A. H. WATTS.

Doctors' Letters

SIR,—I would like to add a further point to Dr. John Fry's remarks (July 30, p. 384) about the hospital letter. This is that, in the case of out-patients, it should show clearly who conducted the main part of the consultation and examination. On two occasions in the last year I have been misled into thinking that the consultant had seen the patient personally. In each case the letter was signed by a consultant and started, "Your patient attended the clinic on . . ." and finished with, "I think that treatment should be . . ." Only later did I discover that these letters had been written second-hand from someone else's consultation.

In the first case the registrar had instructed the patient to alter his hypotensive drugs, but when the patient came to ask me for a further prescription I merely had the consultant's letter advising that the drugs should be continued unchanged. It took a little while to restore the patient's confidence. In the other case when the patient came to me after attending out-patients the question arose of having an operation done privately. While discussing the consultant's findings the patient said emphatically, "But I did not see Mr. ——." I took this up with the consultant, who maintained that he had seen the patient. The patient then identified the registrar, and the consultant later admitted that he had entered the cubicle and looked down the proctoscope as the registrar demonstrated his findings—so they were both right.

It is inevitable that some patients are seen by the registrar or other assistant, and I would prefer them to write their own letters. They can always mention that a particular point has been discussed with the consultant. The idea that all letters should be signed by the "Head of the Department" is more appropriate to the Civil Service or Armed Forces than to medicine, where each of us still retains some personal responsibility towards the patient.

As I wish to make a general point and not a local complaint, I think it would be wrong if my local hospital were identified. Therefore I hope you will allow me to sign myself:

YOUNG PRACTITIONER.

Is this Whooping-cough ?

SIR,—The increasing tendency to milder forms of infectious diseases, resulting either from attenuated strains of the responsible organism or partial immunization, or both, has made accurate, early diagnosis more difficult than hitherto. This is well illustrated by Dr. Stuart Carne's obvious difficulties (July 30, p. 384) in the diagnosis of pertussis and impels us to restate a fundamental and unalterable principle in diagnosis—namely, that laboratory investigations, while providing valuable pointers to diagnosis, must never be allowed to supplant clinical criteria. The diagnosis of pertussis is essentially clinical, and one would be most ill-advised to disregard a history of spasmodic cough simply because laboratory confirmation is lacking.

Dr. Carne does not say at what stage of the disease his investigations were performed, and this is supremely important. To isolate *Bordetella pertussis* it is essential that swabs be taken within two weeks, and preferably within 10 days, of the onset of the disease and that the media be constantly checked. The method employed in this hospital is to use a pernasal swab and a cough-plate containing modified Bordet's medium *which must be fresh*; cough-

plates older than one week are discarded. The technique by which specimens are obtained is important. The cough-plate is held approximately six inches from the patient's mouth during a paroxysm, which may be induced by extending the head, lightly pressing the thumb on the trachea, and then rapidly flexing the neck. After the paroxysm a pernasal swab is taken, as the organism is most likely to be found in the bronchial secretions. With this method there is an 80 to 90% chance of isolating *Bordetella pertussis* in the first 10 days of the illness. Later the organisms quickly disappear from the secretions, presumably on account of antibody production. The characteristic changes in the white blood cells—namely, leucocytosis with absolute and relative lymphocytosis—are a later development, not usually evident until the second week.

In the infectious diseases department of this hospital there are at the present time six cases of whooping-cough, and it might reassure Dr. Carne to see that laboratory findings support the clinical diagnosis in all cases.

Case	Age in Years	Day of Disease	Total W.B.C.	Percent. Lymph.	*Bordetella pertussis*
1. Male ..	16 12	16	19,900	75	Not found
2. ,, ..	6	6	9,700	55	Isolated
		16	41,800	68	
3. ,, ..	2	12	23,300	60	Not found
4. Female ..	4 12	22	17,400	80	,,
5. Male ..	10 52	8	18,200	83	Isolated"
6. Female ..	6 12	8	22,700	80	,,

It should be noted that in Case 2 the W.B.C. count was normal on admission, but 10 days later there was a characteristic picture. Case 4 was admitted on the twenty-second day of the disease with frequent severe paroxysms followed by apnoea, and the outlook must be regarded as grave. This raises a most important clinical consideration, since pertussis, diagnosed within 10 days of onset, may be aborted by chloramphenicol. As the disease is particularly serious in infancy—i.e., under 1 year of age—no effort should be spared to abort it in this age group.

Our experience does not suggest that the disease is in any way changing its form, rather that diagnosis is frequently more difficult, rendering adherence to scientific principles more important than ever.—We are, etc.,

A. MELVIN RAMSAY.
W. N. DUNNET.

Infectious Diseases Department,
Royal Free Hospital,
London N.W.3.

Oral Diuretics in Pregnancy Toxaemia

SIR,—Referring to the letter by Drs. John D. Watt and Elliot E. Philipp (June 11, p. 1807), please will you publish the following.

Most of the cases of pregnancy toxaemia diagnosed during the past five years at the 60 antenatal out-patient clinics in Budapest and its suburbs (2,000,000 inhabitants) were admitted to hospital. More than 1,000 patients have been treated during this period. The three characteristic symptoms of toxaemia—i.e., high blood-pressure, proteinuria, and oedema—became manifest after the 24th week of pregnancy. Of these symptoms, we consider the extensive oedema to be due to circulatory insufficiency. We base this on the small protein content of the oedema liquor and its static position in accordance with gravity as well as other signs and symptoms—enlarged liver, etc. —apart from the variation of the serum protein fractions present in consequence of the proteinuria and the hypalbuminaemia.

Since causative treatment is impossible, the treatment of the insufficiency of circulation seems very important. If several days' bed-rest and a diet containing but small quantities of salt give no result, the patients are given strophanthine or digitalis together with oral diuretics. To begin with, chlorothiazide was prescribed as an oral diuretic, but lately only hydrochlorothiazide has been given. It is given in doses of 25 to 50 mg. daily—with adequate intervals—and careful watch is kept on the electrolyte equilibrium. Patients treated in this way became compensated, their oedema disappeared, and their general condition was satisfactory when labour set in.

More than 100 cases were treated in this way without intrauterine death or noxious effects to mother or foetus. —I am, etc.,

Schöpf-Merei Hospital,
Budapest, Hungary. REZSÖ NAGYIVANYI.

SIR,—It was with great interest and relief that I read the experienced and mature, yet kindly, reply of Mr. Robert A. Tennent and Mr. David W. Leslie (July 2, p. 64) to the original letter by Mr. J. D. Watt and Mr. E. E. Philipp (June 11, p. 1807), who suggest that the use of chlorothiazide diuretics during pregnancy might be responsible for intrauterine death. Many women consume tea or alcohol during pregnancy. Both have diuretic action, but it would be most unreasonable to suggest that these were the cause of intrauterine death, if this were to occur.

The authors[1 2] whose experience with the chlorothiazide diuretics has been published all refer to the great benefit to be derived from them when the more classic treatment of pre-eclampsia is unsuccessful. Our own experience (29 cases of oedema during pregnancy treated with "naturetin") bears out the usefulness of these agents. However, it is generally agreed that they do not alter the toxaemic process.

It is common knowledge that in the past foetal and infant loss in severe pre-eclampsia approached 20%,[3] and this was long before chlorothiazide diuretics were used. Messrs. Watt and Philipp speak of five cases without describing either the total number of cases dealt with or the severity of the pre-eclamptic state in the patients concerned. Furthermore, they themselves treated only two cases, the other three having been treated by other practitioners. In no instance is the severity of the "toxaemia" mentioned and no description is given of the treatment, if any, employed before the diuretics were used.

Until they can produce more convincing data their letter must be looked upon as harmful.—I am, etc.,

New York. RICHARD SANDS.

REFERENCES
1 Tennent, R. A., and Leslie, D. W., *Scot. med. J.*, 1960, **5**, 113.
2 Landesman, R., Ollstein, R. N., and Quinton, K. J., *N.Y. St. J. Med.*, 1959, **59**, 66.
3 Eastman, N. J., *Williams Obstetrics*, 11th ed., 1956. Appleton-Century-Crofts, N.Y.

Collapse after Oral Diuretic

SIR,—Following Dr. C. J. G. Franklin's letter (August 20, p. 600), it may be of interest to record the following case.

A woman of 58 in apparent good health had donated one pint of blood on six previous occasions with no ill effects. Immediately following the completion of her latest venesection, again of one pint, she became profoundly hypotensive and lost consciousness. After about one minute her blood pressure rose to 125/80 and she regained consciousness. She was therefore admitted to hospital under the care of Dr. John F. Wilkinson for five days: her blood pressure remained around 125/80 throughout this period. At no time did she complain of chest pain, and

there was no electrocardiographic evidence of myocardial infarction; her serum electrolytes, urea, and cholesterol were normal.

After admission to hospital she told us that on account of obesity (her blood pressure being then 160/100), her general practitioner had given her tab. thyroid. sicc. 1 gr. (65 mg.) daily and tab. chlorothiazid. 0.5 g. on alternate days for the week prior to the blood donation.

Fainting attacks are not uncommon after venesection, and it is possible that diuretics would predispose to such attacks. In view of the present widespread use of potent oral diuretics it would seem wise to inquire of all blood donors whether they are on such treatment. Should syncope prove to be more common in those on diuretics, it might be inadvisable to use such persons as blood donors.—We are, etc.,

MARTIN S. BOURNE.
ROBERT BROWN.

Department of Haematology,
Manchester Royal Infirmary.

Hazards of Iron-dextran

SIR,—The case of "Possible Association of Malignant Neoplasm with Iron-Dextran Injection" reported by Drs. C. E. G. Robinson, D. N. Bell, and J. H. Sturdy (August 27, p. 648) raises some interesting points not mentioned in your annotation (p. 659). The most important is how the injections came to be given in the deltoid region when the makers specifically state that it should be given in the gluteal region and supply a diagram with each batch of ampoules to show exactly where. Then there is the bland statement of the writers, who are commendably frank and fair, that "it is not known whether these (injections) were administered intramuscularly or subcutaneously." It is difficult to believe that a doctor sufficiently interested in his patient to send her three times for in-patient investigation would not know the need to give "imferon" into a muscle. But if it were so given where is the connexion between the injections and the tumour? And, had 12 ml. been given subcutaneously, staining of the skin would probably have been present even four years afterwards, particularly in a woman of 74, for I have several times seen such staining on the buttocks of young women who have had injections given that time before by nurses in hospital who had not taken precautions to prevent seepage back along the track of the needle.

In a previous letter (March 26, p. 960) I pointed out what precautions I think should be taken in giving imferon, and, in the interests of medicine and particularly in view of the publicity given to this case by the *Daily Telegraph*, I think your annotation should at least have pointed out that the injections were not given according to the makers' instructions, that the likelihood of there being any causal connexion was very slight, and that any drug used incorrectly can do a lot of damage. This does not, of course, mean that the case should not have been reported or its significance overlooked—but its evidential value is slight. It should not cause a scare, and its main lesson is to give drugs properly.—I am, etc.,

Winsford, Cheshire. W. N. LEAK.

Examination of C.S.F. for Malignant Cells

SIR,—Your annotation (June 11, p. 1797) on the cerebrospinal fluid in intracranial tumours draws attention to the value of cytological examination. The published methods for preparing smears of C.S.F. cells have not proved satisfactory in our hands as a routine procedure when applied to fluids containing a small excess of cells (around 10/mm.^{3}). A considerable improvement has been obtained by using a new technique to prepare smears from the deposit obtained after centrifuging the C.S.F.[1] In this method the deposit is suspended in 3–4 μl. of 30% bovine albumin (Armour) using a fine pasteur pipette, and this is also used to transfer the drop of cell suspension on to a glass slide for spreading like an ordinary blood film.

The value of this method is shown by the fact that, in the 18 months during which we applied this technique as a routine to all C.S.F.s containing more than five cells/mm.^{3} (approximately 400) sent for routine examination, 23 were found to contain malignant cells. The findings in the C.S.F.s of the first 17 of these cases are being reported.[2]

It was not found possible to predict (1) in which C.S.F.s malignant cells would be found, either from the C.S.F. protein or glucose levels; (2) whether the intracranial neoplasia was primary or secondary in origin or if it was a single tumour or carcinomatous meningiopathy. In several cases the finding of malignancy was not expected clinically, though the subsequent histology supported the C.S.F. finding. There was one known false positive in a case of chronic granulomatous leptomeningitis (Boeck's sarcoidosis).—We are, etc.,

D. MARRACK.
VINCENT MARKS.

Department of Chemical Pathology,
Institute of Neurology,
London, W.C.1.

REFERENCES

[1] Marks, V., and Marrack, D., *Confin. Neurol. (Basel)*, 1960, in press.
[2] —— —— *J. Neurol. Neurosurg. Psychiat.*, 1960, in press.

Treatment of Chronic Furunculosis

SIR,—In their article on "The Treatment of Chronic Furunculosis" Dr. L. G. Tulloch, Mr. V. G. Alder, and Dr. W. A. Gillespie (July 30, p. 354) discuss the detection and eradication of sources of reinfection with staphylococci in the treatment of this condition. They discuss at length the various sites in the body from which reinfection can occur, but make no mention of the mouth. Although *Staphylococcus pyogenes* is by no means a common inhabitant of chronic alveolar abscesses, its occasional presence should be considered and appropriate steps taken.

A rough check on the swabs sent for bacteriological examination from oral lesions during the last two years in one unit shows that approximately 5% on culture yielded *Staphylococcus pyogenes.* The commonest organism was *Streptococcus viridans,* whilst *Staphylococcus albus* (mainly coagulase-negative) was also found. From this it would appear that patients with chronic furunculosis would, in addition to putting antibiotic paste up their noses and washing their perineums, be well advised to have chronic discharging abscesses removed from their mouths.

But the authors of this article are not alone in ignoring the mouth as a potential reservoir of *Staphylococcus pyogenes.* The recent Ministry of Health pamphlet *Staphylococcal Infections in Hospitals*[1] made no mention of the fact that *Staphylococcus pyogenes* may be harboured in the mouths of patients and their attendants. There was no recommendation put forward that mouths of all concerned should be checked and chronically infected areas eradicated. This was surprising in view of the thoroughness with which other potential hazards were tackled. In this booklet, staff were encouraged to report "any minor ailment, including

septic lesions of the skin, however trivial." They were not encouraged to do anything about any septic lesions they may have in their mouths. It is possible that a source of reinfection is being overlooked.—I am, etc.,

Royal Alexandra Hospital, Rhyl. F. G. HARDMAN.

REFERENCE

[1] Ministry of Health, Central Health Services Council, Standing Medical Advisory Committee, *Staphylococcal Infections in Hospitals—Report of the Subcommittee*, 1959, H.M.S.O., London.

SIR,—Dr. L. G. Tulloch and co-workers in their article on the treatment of chronic furunculosis (July 30, p. 354) rightly stress the importance of disinfecting carrier sites (nose, perineum, ears, eyelids) by means of a local antibiotic, particularly neomycin, and hexachlorophane dusting powder. It is also essential to prevent further seeding of staphylococci from boil-bearing areas, for which they recommend swabbing twice a day with 1/3,000 aqueous solution of mercuric chloride. The most reliable method in my experience consists in sponging the boils and surrounding skin for five minutes once daily for about a week with 70% alcohol followed by painting with 1% aqueous gentian violet. Patients should be told to avoid adhesive dressings and all macerating remedies (poultices, kaolin, magnesium sulphate) and to stop bathing when active boils are present, so as not to spread the infection via towels. As the authors state, patients must be given a clear and simple explanation of the nature of staphylococcal carriage and infection. The correct therapeutic approach to recurrent boils certainly is an external one and not with systemic antibiotics, which get ordered far too often. These have no preventive effect; indeed, it is noteworthy that of the '58 causative staphylococci in the authors' cases, 25 (43%) were penicillin-resistant, some of them being resistant also to streptomycin and tetracycline.—I am, etc.,

London W.1. E. W. PROSSER THOMAS.

Pain after Short-acting Relaxants

SIR,—In their article comparing post-operative pain and stiffness after the use of suxamethonium and suxethonium compounds (August 20, p. 579), Drs. G. D. Parbrook and G. F. M. Pierce explain the difference between their figures and mine[1] as due to a difference in anaesthetic technique, but this I cannot accept because my technique was constant throughout and I was comparing suxamethonium and suxethonium side by side.

In my investigation (the reference to which is omitted from your article) a comparison was made under closely similar conditions, inasmuch as all operations were performed by one surgeon and all anaesthetics were given by myself. The age-groupings were roughly comparable and the sex incidence the same. I was able to compare directly in the same patient on several successive operations. Furthermore, I employed approximately equipotent doses of the two drugs, doses which were almost the same in proportion as those used by Drs. Parbrook and Pierce.

My figures show that when all patients are questioned directly there is a reduction in the incidence with suxamethonium (50% to 34%). This, however, is not so significant as the change observed in the severity of these pains, which I found so slight that spontaneous complaints with suxethonium only occurred in 12 patients out of a total of 285, as compared with 10 out of 60 for suxamethonium. Drs. Parbrook and Pierce record "severe stiffness or pain" in 13 out of 50 patients with both suxamethonium and suxethonium, but their criteria for "severe stiffness or pain" must be different from mine because they state also that "very rarely did any patient complain of symptoms directly to us." I used for my investigation the gradings by Hegarty,[2] and by these standards mild pains will probably pass without complaint, but moderately severe and severe pains will always be accompanied by spontaneous complaints.

I can state with confidence that after considerable experience with suxethonium I have encountered very few moderately severe or severe pains, and I have little hesitation in employing it in my practice to-day. Even though it is only relatively pain-free, it is vastly superior to suxamethonium.—I am, etc.,

London W.1. G. E. HALE ENDERBY.

REFERENCES

[1] Enderby, G. E. H., *Brit. J. Anaesth.*, 1959, **31**, 530.
[2] Hegarty, P., ibid., 1956, **28**, 209.

*** We much regret the unintentional omission of the reference to Dr. Enderby's article.—ED., *B.M.J.*

Suxamethonium Muscle Pains

SIR,—With reference to the letters by Dr. R. J. T. Woodlands (July 30, p. 393) and Dr. P. J. Tomlin (August 20, p. 604) in connexion with muscle pains after suxamethonium in conjunction with electroplexy, I had occasion to see recently a woman of 55 with a straightforward endogenous depression who had had a radical mastectomy for carcinoma. She had previously been given E.C.T. for the same condition but had declined to continue because of the severe pain. However, I persuaded her to start treatment and a muscle relaxant was used with thiopentone, but she again refused to continue owing to the pain. I subsequently tried using thiopentone alone, and the pain throughout the general site of the operation was very much reduced and the patient was quite prepared to continue and benefited from the treatment.—I am, etc.,

Springfield, nr. Chelmsford. J. E. G. VINCENZI.

Hypnotic Treatment of Asthma

SIR,—I enjoyed reading Dr. Griffith Edwards's interesting paper (August 13, p. 492) and would like to congratulate him on a thoughtful study. There are several points which I feel should be made.

For a pilot study of the effectiveness of treatment the choice of patients was perhaps unfortunate in that, of six, two were poor hypnotic subjects and one developed pulmonary tuberculosis during the period of observation, presumably with impairment of pulmonary function. This leaves only three patients (Cases 1, 3, and 4) in whom the effect of treatment might be measured.

No reason was given for the choice of only "several days of suggestion under hypnosis" on in-patients, with no supportive out-patient treatment. Hypnotherapy is still looked on by some as magic, by others as nonsense, and only occasionally is it employed in a common-sense fashion. In the present instance drama was anticipated, perhaps unwisely. Of the three who can be seriously analysed, asthma had been established for 7, 18, and 28 years respectively, yet hypnotherapy was given on only six, six, and five occasions (Case 4 was given five further "booster" sessions as an out-patient and was taught the technique of auto-hypnosis). Surely an "asthma habit" of many years' standing cannot be lastingly broken by so few treatments extending over such short intervals.

With regard to the ventilatory function tests in these three patients: maximum breathing capacity (M.B.C.) of the first rose from 42 to 104 litres during the course of seven days' treatment and a month later rose to 114 litres; the fact that it could be raised by another 14 litres by using a spray, although noteworthy, does not detract from the

remarkably good effect already observed. Some 16 months later the patient observed that the treatment had been most successful and that there was no comparison with his previous state, but the M.B.C. was found to have fallen to 78 litres/min., the patient had put on 1½ stone (9.5 kg.) in weight, and it was a pity that measurements using a spray were not repeated to differentiate the extent of impairment due to spasm from that due to increased adiposity. Case 3 seems to have increased her M.B.C. from 40 to 137 litres during her first admission, a most satisfactory immediate response to treatment. Case 4 improved from an M.B.C. of 27 to 129 litres; again this represents a good response, which the spray test revealed as a complete remission. In each instance subsequent relapse after discharge may well have related to a failure to provide adequate supportive treatment.

Like Dr. Griffith Edwards, I feel that claims for or against the hypnotic treatment of asthma are quite meaningless unless controlled studies are conducted. One such controlled study is under way: out-patient treatment being given for six months, with supportive auto-hypnosis whenever possible. This would seem a more reasonable time for treating habit-spasms of many years' duration.—I am, etc.,

Colindale Hospital, London N.W.9. G. P. MAHER-LOUGHNAN.

SIR,—The paper by Dr. Griffith Edwards on the hypnotic treatment of asthma (August 13, p. 492) makes interesting and instructive reading. That such remarkable results can be obtained by a few treatments of hypnotic suggestion without attempt at psychological interpretation must surprise many readers. But then hypnosis is always puzzling everybody, including the hypnotist.

Clinically we know that every case of asthma is a psychiatric problem. Every medical hypnotist, with any pretensions to the understanding of psychological mechanisms, must expect relapse without adequate explanation and insight given during psychotherapeutic treatment. Dr. Edwards proves this point.

The pilot study should be taken further. The six patients must now be subjected to adequate psychological treatment and then further assessment made. It must be remembered in this respect that some of us[1 2 3] have shown that relapse will occur if birth traumata are not taken into consideration. Studies with lysergic acid (L.S.D. 25) bear witness that many asthmatics commenced their burden within the birth canal itself,[4 5] and this may be the explanation of so much varying thought in the aetiology of the condition. A combination of hypnosis and psychotherapy, with or without L.S.D., must eventually supersede treatment by steroids, etc.—I am, etc.,

London, W.1. GORDON AMBROSE.

REFERENCES

1 Kelsey, D. E. R., *J. ment. Sci.*, 1953, **99**, 216.
2 Ambrose, G., *S. Afr. Practit.*, 1960, **7**, 41.
3 —— and Newbold, G., *Handbook of Medical Hypnosis*, 2nd ed., 1958. Baillière, Tindall and Cox.
4 Nichols, L. A., personal communication.
5 Ling, T., personal communication.

SIR,—In his pilot study of six asthmatics treated by hypnosis, Dr. Griffith Edwards states (August 13, p. 492) that, apart from direct suggestion to the relief of anxiety, no form of psychotherapy was used. The essential function of the physician has been defined as the healing of the sick; and this has always been accepted as including the sick in mind as well as in body. Hypnosis is merely an adjunctive technique in therapy, but I must stress that any physician wishing to utilize it in the treatment of asthma must have some background in psychodynamics. As Bignall puts it,[1] "it is generally more profitable to explore the patient's mind and his environment than the lungs." From my own point of view,[2] asthma constitutes a nervous breakdown of the respiratory apparatus. All the essential elements are present: the weeping mucous membrane, the tensed bronchial tubes, and the disturbance of sleep.

Asthmatics are characterized by what one might term an increased sensitiveness, both of the mind and of the body, than those whom we might described as tough. The sensitive or tender find life more difficult from the emotional point of view because they are more aware of, and more responsive to, the impact of the personalities of those around them and also because they are more aware of themselves. They are the thinking, feeling type and often are disturbed by conflicts within their own personalities. On the physical side their physiological make-up appears to be more labile, more easily disturbed in functions by environmental factors, and in closer rapport with their emotional conditions. Thus any kind of psychological upset has marked repercussions, giving rise to parasympathetic hyperactivity which produces spasm of the bronchial mucosa and an oversecretion of viscid mucus which occludes the bronchi.

In all asthmatics autonomic visceral reflexes are involved; conditioned reflexes are in evidence; in many of them the psychic element either determines the incidence of the attacks or explains the entire condition. The conditioned reflex once established continues to operate after the real exciting factor has ceased to apply. Conversely, if the patient can be kept free for several months he is quite likely to remain free for the rest of his life. Hypnosis acts both by decreasing the hyperactivity of the vegetative nervous system and by interrupting the conditioned reflex arc which can precipitate an attack.—I am etc.,

London, W.1. A. P. MAGONET.

REFERENCES

1 Bignall, J. R., *Med. Press*, 1953, **230**, 526.
2 Magonet, A. P., *International Journal of Clinical and Experimental Hypnosis*, 1960, **8**.

SIR,—In his interesting article on this topic (August 13, p. 492) Dr. Griffith Edwards mentions that one cannot expect to relieve a severe attack of asthma rapidly by hypnosis. It is, however, surprising in my experience how the rapid, distressed, and wheezing breathing of the asthmatic can be relieved in a few minutes in many cases under hypnosis, because the spasm is relieved by suggestion. The patient can then be left quietly asleep and to wake up free from the attack.

It is true that excessive claims are made as to cure by this means. After considerable experience with patients of all ages, who showed apparent improvement, I was enabled recently to carry out a circumscribed but carefully controlled experiment with 25 children who received hypnotic treatment, and 25 who had a simple interview each week, in the asthma clinic directed by Dr. J. Morrison Smith. The results were estimated both from record cards and from spirometric readings before and after, over monthly periods. There was no objective evidence of improvement, though subjective results were claimed by a number.[1] This does not, in my view, invalidate the possible use of psychological methods in asthma, with hypnosis as part of them.

One final, philosophic point: I do not understand why Dr. Edwards chooses to assume as a hypothesis that

asthma is always somatic in origin. The very fact that it is influenced by suggestion points to the "psychic"; however, this is more a semantic than a practical point. We should continue our efforts.—I am, etc.,

Birmingham, 15. C. BURNS.

REFERENCE

[1] Morrison Smith, J., and Burns, C. L. C., *Brit. J. Dis. Chest*, 1960, **54**, 78.

Anorexia Nervosa

SIR,—We wish to report an example of this condition which has been successfully treated by the method described by Drs. P. J. Dally and W. Sargant (June 11, p. 1770).

A woman aged 24, 5 feet (1.5 m.) tall and weighing 5 stone 6 lb. (34.5 kg.), was admitted to hospital with a three-year history of anorexia. At the age of 20 she had weighed approximately 8 stone (50.8 kg.). There was no evidence of psychosis; amenorrhoea and obstinate constipation had existed for two years.

Clinical examination was normal on admission, apart from extreme emaciation, although she was physically hyperactive. She had recently undergone in-patient treatment at another hospital, but had failed to gain weight. Her childhood and schooling had been normal and she was happily employed as a clerical worker. In late adolescence she had weighed 10 stone (63.5 kg.). She then began to reduce weight by not eating; she lost interest in food, and her anorexia persisted. She was engaged to be married, and was virgo intacta. Her sexual history was characteristic of anorexia nervosa, with self-reproach for minor indiscretions and an apparent association between gastronomic and sexual excesses.

She was given complete rest in bed and a light diet initially, which was progressively increased in protein and calorific content. She received oral chlorpromazine 150 mg. daily, which was subsequently increased to 300 mg. daily. Owing to the development of a diffuse erythema, promazine ("sparine") 100 mg. t.d.s. was substituted. Insulin was administered each morning to the point of sweating and drowsiness, beginning with 5 units and rising to 40 units after 10 days. Following 30 days of this combined treatment she weighed 6 stone 10 lb. (42.6 kg.), a gain of 18 lb. (8.1 kg.).

Rest in bed is an essential part of this treatment, for it counters the overactivity of these patients and facilitates careful supervision of diet and medication. The gain in weight shown by this patient compares with that of the cases reported by Drs. Dally and Sargant, although she gained only 1 lb. (0.4 kg.) during the first two weeks and 17 lb. (7.7 kg.) during the second two weeks of the regime. It is of interest that, in the event of chlorpromazine hypersensitivity, sparine appears to be an effective substitute.—We are, etc.,

Downview Hospital, Sutton, Surrey. N. I. LAVIN. J. C. BARKER.

Cat Phobia

SIR,—In few weeks during the last 35 years have I not asked my hospital and private patients about their attitude towards cats. As can be imagined, the answers have varied from passionate devotion to hate and fear, with indifference but rarely. Mild fears, often expressed as dislike, have been common and persistent, but it has been noteworthy that many subjects have lost their aversion and even become fond of the animals without any treatment whatever beyond that given by life itself, which tends to support the aphorism that behind every unreasonable fear lurks a wish.

I remember only one instance of a disabling cat phobia. A middle-aged woman returning from the East thirty years ago was so scared that she paid the sailors £1 for every cat they threw overboard. It cost her £13. She was relieved of her phobia by talks with my friend Millais Culpin, but a year or two later she complained to me of functional eye symptoms which seemed to have replaced the phobia.

The value to me of the article by Dr. H. L. Freeman and Dr. D. C. Kendrick (August 13, p. 497) is not so much in the method of treatment, which after all links up with the way Nature herself deals with most of our fears, as in the paraesthesiae found to accompany the fear. Partly to trace the origin of the phobia and partly to discover how often it was associated with sensory and vasomotor disturbances of the hands, and especially the fingers, was the object of my own inquiry. The correlation of the latter is so high that an old forgotten fear can often be traced from the persistent physical symptoms.

An over-fondness for cats can be as dangerous as a fear. In one of my patients it cost the sight of an eye.[1]—I am, etc.,

Portsmouth. W. S. INMAN.

REFERENCE

[1] Inman, W. S., *Trans. ophthal. Soc. U.K.*, 1935, **55**, 405.

SIR,—I am glad Dr. Edward Glover (August 27, p. 671) has put the article on cat phobia by Dr. H. L. Freeman and Dr. D. C. Kendrick (August 13, p. 497) into perspective, and corrected the mistake concerning his own alleged views on the value of psycho-analysis, which I have noted repeated in more than one recent article.

As a naive, not to say simple-minded, description of a case of phobia the article in question would be hard to beat. Why fill the account up with a detailed history of the case when it had not the slightest bearing on the treatment, which was purely symptomatic? Was it really necessary to call in the services of a psychologist to "determine which stimuli produced the fear reaction"? Could not the psychiatrist by a special effort of the intellect and imagination have worked it out for himself? Was the mention of dreams—particularly the dream of the patient murdering her father with a poker—merely put in for dramatic effect, if it was not to have any connexion at all with the treatment? I suggest that the homicide dream may, after all, be of some seriousness and should be treated by the same "behaviour therapy." This would clearly be by getting the unhappy patient accustomed to the idea of homicide. She might start with insects, and work up through the animal kingdom.—I am, etc.,

Hythe, Kent. FREDERICK DILLON.

Guanethidine and Tolerance

SIR,—In the course of his excellent article entitled "Drugs in the Treatment of Hypertension" (August 27, p. 660), Dr. D. G. Julian makes reference to bretylium tosylate ("darenthin") and guanethidine ("ismelin"). These are naturally considered together, since both may be described as adrenergic-blocking agents. In the section describing the therapeutic effects of the two drugs, the following sentence occurs: "Tolerance develops with both bretylium and guanethidine and a gradual increase of dosage may be necessary for several months." In fact, this statement does not accurately reflect current clinical experience in regard to the latter drug.

Guanethidine has been under intensive clinical investigation in this country for more than 12 months, and I have received reports from numerous British clinicians who have given the drug to large numbers of patients. The following quotations correspond well with careful assessments from many sources, and at present it appears beyond dispute that in the matter of tolerance guanethidine presents no problems. It is not, for instance, necessary to increase the dosage gradually once the appropriate maintenance level has been established.

"The advantages of guanethidine are freedom from parasympathetic side-effects and absence of drug tolerance."[1] Again referring to guanethidine, "Its action is apparently steady; tolerance does not develop; and out-patient care of cases is relatively easy."[2]

—I am, etc.,

A. K. PITTMAN,
Director of Clinical Research,
Ciba Laboratories Limited.

Horsham, Sussex.

REFERENCES

1 Dollery, C. T., Emslie-Smith, D., and Milne, M. D., *Lancet*, 1960, **2**, 381.
2 Evanson, J. M., and Sears, H. T. N., ibid., 1960, **2**, 387.

Hypertension in African Populations

SIR,—The recent W.H.O. publication on hypertension and coronary heart disease[1] has stressed the need for a more definitive state of knowledge on these two subjects among contrasting populations. In Africa information on hypertension is contradictory. A recent review[2] bearing on this subject provided seven references which indicated the condition to be as common or commoner in Africans compared with Whites, and six references which suggested the converse. Of the eleven references given concerning Central and Southern Africa, only three related to populations at risk (in contrast to hospitalized patients). The first contribution, that of Donnison,[3] showed that hypertension among Kenya Africans was rare 30 years ago. The second, that of Gelfand,[4] indicated the condition in Southern Rhodesia to be less common among healthy young Bantu males 20–40 years when compared with figures given in Gover's study[5] on American White farm families receiving assistance from the Farm Security Administration. The third study, the most extensive of the three investigations, was undertaken by Ordman[6] on South African Bantu groups. In his series it is apparent that hypertension, exceeding 90 mm. diastolic pressure, is roughly of the same order as that given in Gover's series, and in the comprehensive investigation of Americans by Master *et al.*[7] The incidence of hypertension, however, is lower in the Bantu compared with the White groups when the standard 140/90 mm. is employed. The fact that hypertension is common in the Bantu has been confirmed by us in larger numbers of subjects than Ordman in respect of Pedi Bantu in North Eastern Transvaal, Baralong Bantu in Northern Orange Free State, and Tswana Bantu in Southern Bechuanaland.

Although Ordman considered the incidence of hypertension in Bantu populations not to be affected by tribal grouping, examination of his data suggests that there may be regional differences. We have confirmed their existence. From a recent study on several hundred young Bantu mine-workers (20–50 years) from different parts of Southern Africa, it is clear that hypertension is commoner, for example, in Shangaan Bantu from Mozambique compared with Xhosa Bantu from Transkei. Differences in hypertension among population groups, of course, have been noted elsewhere. For example, in the Shanghai region the condition was found to be three times more common in Chinese factory workers compared with farmers[8]; in India it is far commoner in high compared with low socio-economic groups.[9] Moreover, in groups of indigent South African Whites ("Poor Whites") habituated to a diet and manner of life similar in several respects to that of the Bantu, we have found a somewhat lower incidence of hypertension compared with Gover's American series.[5]

Although hypertension is common among the Bantu, it is noteworthy that, in contrast to the American Negro (among whom the condition is probably more common[2]), the feature is consistent with the virtual absence of coronary heart disease mortality.[10–12] Only apparently in populations among whom mortality is high does there seem to be marked association with hypertension. This was well brought out in the Framingham study,[13] and has been noted recently in Russian experience.[14] In contrast, hypertensive heart disease among the Bantu is common and mortality is high.[10] Cerebral vascular disease mortality also is high (as with the Japanese[15] and possibly the Chinese[8]). Indeed, available evidence suggests that for the 45–64 year Bantu age group the mortality rate is possibly higher than among some Western populations.[15] Why is hypertension common in some peoples and social classes but less so in others? And why, as with the Bantu, noxious in certain disease processes but less so in others?

As already indicated, evidence is more than suggestive of regional differences in hypertension among the Bantu. One avenue of approach in seeking to elucidate the cause of these differences is to determine whether a correlation obtains between hypertension and salt intake. In South Africa we are favoured by having population groups differing vastly in this respect. Some Bantu groups consume very soft water. Others flavour their stews with plant ashes of variable composition. At the far extreme is one isolated group, which we have just visited, where both animals and man habitually consume water of salinity about one-third of that of sea water without grossly obvious ill effects. It is our hope that, among contrasting Bantu populations, study of salt intake (and other aspects of diet), serum electrolyte levels, blood-pressure, and incidence of cerebral vascular disease may be rewarding.—We are etc.,

ALEXANDER R. P. WALKER.
K. L. MORTIMER.
J. W. DOWNING.
J. A. DUNN.

South Africa Institute for Medical Research, Johannesburg.

REFERENCES

1 First Report of the Expert Committee on Cardiovascular Disease and Hypertension. *Wld Hlth Org. techn. Rep. Ser.*, 1959, No. 168.
2 Philips, J. H., and Burch, G. E., *Amer. J. med. Sci.*, 1959, **238**, 97.
3 Donnison, C. P., *Lancet*, 1929, **1**, 6.
4 Gelfand, M., *W. Afr. med. J.*, 1952, **1**, 91.
5 Gover, M., *Publ. Hlth Rep. (Wash.)*, 1948, **63**, 1083.
6 Ordman, B., *Clin. Proc.*, 1948, **7**, 183.
7 Master, A. M., Dublin, L. I., and Marks, H. H., *J. Amer. med. Ass.*, 1950, **143**, 1464.
8 Ch'eng-Lang, T., and Shou-Ch'i, T., *Chin. med. J.*, 1959, **79**, 290.
9 Padmavati, S., and Gupta, S., *Circulation*, 1959, **19**, 395.
10 Becker, B. J. P., *S. Afr. J. med. Sci.*, 1946, **11**, 107.
11 Higginson, J., and Pepler, W. J., *J. clin. Invest.*, 1954, **33**, 1366.
12 Schrire, V. and Uys, C. J., *Amer. J. Cardiol.*, 1958, **2**, 453.
13 Dawber, T. R., Moore, F. E., and Mann, G. V., *Amer. J. publ. Hlth*, 1957, **47**, Suppt. 4.
14 Maisnikov, A. L., *Amer. J. Cardiol.*, 1960, **5**, 692.
15 Walker, A. R. P., and Grusin, H., *Amer. J. clin. Nutr.*, 1959, **7**, 264.

Gentlemen Boxers' Brains

SIR,—Drs. F. B. Byrom and P. M. Daniel (August 13, p. 540) write under the above heading: "The punch-drunk syndrome is a form of gross dementia which is now universally recognized as a serious occupational hazard of professional boxing." If Drs. Byrom and Daniel, or indeed any other medical men, know of any cases of the punch-drunk syndrome which have occurred as a result of professional boxing during the last 12 years in Great Britain or Northern Ireland, the British Boxing Board of Control would be grateful for particulars.

During the past 12 years there have been many thousands of professional contests under the jurisdiction of the Board of Control, but no cases of the punch-drunk syndrome have come to the notice of the medical officers of the Board. Until they do, the Board are quite justified in maintaining that nowadays the punch-drunk syndrome does not occur in professional boxing.—I am, etc.,

Ramillies Buildings,
Hill's Place,
London W.1.

J. W. GRAHAM,
Administrative Steward,
British Boxing Board of Control.

Operating on the Wrong Limb or Digit

SIR,—The Council of the Medical Defence Union is becoming increasingly perturbed by the number of occasions on which it is confronted with a patient's claim for compensation based upon the fact that an operation was performed on the wrong limb or digit. During the past twelve months the Union has dealt with no fewer than nine such claims, and it is hardly necessary to say that cases of this sort are quite indefensible.

Such mistakes are not infrequently due to an error in the clinical notes—for example—the word "right" instead of "left" is entered, or, in the case of a finger or toe, the digit is wrongly numbered or described in the notes. The mistake is sometimes due to the fact that the wrong limb or digit is prepared for operation. In so far as the designation of fingers is concerned, the Council reiterates[1] its suggestion that, in order to avoid any possible misunderstanding, the affected digit should be described as the "thumb," the "index finger," the "middle finger," the "ring finger" and the "little finger" and not as the "first," "second," "third," etc., finger.

In view of its recent experience the Council of the Medical Defence Union considers it is only proper that the attention of the profession should be drawn to these unfortunate and avoidable mishaps.—I am, etc.,

London W.C.1.

PHILIP H. ADDISON,
Secretary,
Medical Defence Union.

REFERENCE

[1] Forbes, R., *Brit. med. J.*, 1955, **2**, 851.

Awareness and Imagination

SIR,—The recent case of a man who died with a swab in his larynx, after he had written (being unable to speak) an urgent warning that he would choke, raises the question whether patients should be listened to by nurses and doctors. Do we too easily ignore patients' complaints and anxieties as neurotic irrelevancies?

An eminent patient (albeit himself a physician) was taken to his own teaching hospital with broken ribs after a car accident. It took him two days to convince his bantering colleagues that he was more ill than they thought, and a ruptured spleen was found and sutured just in time.

A woman with atypical Cushing's syndrome insisted that her pain in the side was not just fibrositis, and *x*-ray showed spontaneous fracture of osteoporotic ribs. A fat, plethoric, garrulous woman pleaded with tears that the charge of gluttony was false, but she was disbelieved until a slow-growing adenocarcinoma of the adrenal gland was eventually discovered.

The late Sir Robert Hutchison divided doctors into Poo-Poos and Wind-ups. Awareness and imagination will save the former from pitfalls. Excessive anxiety is disruptive, but a little anxiety stimulates awareness. Osler's "aequanimitas" is not synonymous with complacency.—I am, etc.,

London W.1.

S. LEONARD SIMPSON.

Wilson-Barkworth Fund

SIR,—The Wilson-Barkworth Fund, created by the Will of the late Emily Wilson-Barkworth, is available for assistance for education at Winchester College of the sons of members of the Royal College of Surgeons of England. The normal grant is £30 per term, but this may be increased or diminished according to the circumstances of the parent. The trustees cannot make a grant until the boy has obtained a place at Winchester.

The president of this college has recently been approached by the clerk to the trustees asking for assistance in publicizing this fund, which is not being fully used, and I write accordingly to request that the purpose of the fund may be made known in your columns. Parents or guardians wishing to apply for financial assistance from the fund are invited to complete a form of application which may be obtained from the Clerk to the Trustees, the Wilson-Barkworth Fund, Messrs. Gray Dodsworth and Cobb, Duncombe Place, York.—I am, etc.,

Lincoln's Inn Fields,
London W.C.2.

KENNEDY CASSELS,
Secretary, Royal College of Surgeons of England.

POINTS FROM LETTERS

Books on Brucellosis

Dr. I. M. LIBRACH (Romford, Essex) writes: In his review (August 27, p. 651) of *Brucella Infection and Undulant Fever in Man* by Sir Weldon Dalrymple-Champneys, Professor L. P. Garrod says that it is the first book on the subject to be published in this country. I think he must have forgotten the prior claim of the small 115-page paper-back *Brucellosis in England* by Hugh R. E. Wallis, published by A. S. O'Connor in 1959.

Diploma in Dermatology

Dr. JOHN C. BELISARIO (Sydney, Australia) writes: I have just to-day received the June 18 edition of the *British Medical Journal* and noted on p. 1892, under "Diploma in Dermatology," that I have used the letters F.R.C.P. and F.R.A.C.P. when I meant to write M.R.C.P. and M.R.A.C.P. Also, on p. 1893, fourth line, I have written "fellowship." when I meant "membership." Will you please convey my apologies to your readers for this careless error?

Traction Alopecia

Dr. D. B. JELLIFFE (Uganda, E. Africa) writes: I was interested in the account of traction alopecia given by Professor H. V. Morgan (July 9, p. 115). The same phenomenon can be seen elsewhere where similar hair styles are habitual. This is certainly so in Western Nigeria. . . The term I used for the condition was either tension or vanity alopecia.

Obituary

Sir GORDON GORDON-TAYLOR, K.B.E., C.B.
M.D., Hon.LL.D., Hon.Sc.D., M.S., F.R.C.S., Hon.F.R.C.S.Ed., Hon.F.R.C.S.I., Hon.F.A.C.S., Hon.F.R.C.S. (Canada), Hon. F.F.A. R.C.S.

Sir Gordon Gordon-Taylor died on September 3 after a road accident. He was taken to the Middlesex Hospital, which he had for so long served as a surgeon and to the fame of which he had made his own memorable contribution. Aged 82, he had for years been the doyen of British surgeons and his name had long been a household word among surgeons the world over. He was as popular as he was skilful and erudite, and in any gathering of medical men "G. T.'s" distinguished figure was always at the centre of the most lively discussions.

Born on March 18, 1878, Gordon Gordon - Taylor came, as have so many famous men, from Aberdeen, being educated at Gordon's College and Aberdeen University, where he studied classics. He lost his father early, but his mother encouraged him in his studies, and he worked very hard, though he found time to play cricket, in which he always kept up his interest. He would sometimes go to bed at 8 p.m., asking his mother to wake him at midnight so that he might continue to study during the rest of the night. He took his M.A. with honours in 1898, and ever after was accustomed to make use of his classical knowledge in the preparation of his addresses.

When his family moved to London Gordon-Taylor determined to study medicine, and joined the Middlesex Hospital medical school at the time when Henry Morris, Pearce Gould, and Bland-Sutton were at the height of their reputation. He won the medal in anatomy at the intermediate examination in medicine, and graduated M.B. in 1903. He and his fellow student, Victor Bonney, determined to work for the B.Sc. in anatomy, and for this purpose, while working in the hospital during the day, they stayed up every alternate night and worked in the dissecting-room at comparative anatomy. Sometimes Peter Thompson, the lecturer in anatomy, used to cycle down to encourage them and have a cup of tea at 1 or 2 a.m. Needless to say, both men took the B.Sc. with honours. In 1906 Gordon-Taylor took the M.S. of London and the F.R.C.S. of England, and was soon elected to the surgical staff at the Royal Northern Hospital. A little later he gained a staff appointment at the Middlesex Hospital. His skill and boldness in operating soon made him widely known. To him came the cases which others were inclined to think too difficult, and the difficulty of the case seemed to stimulate and inspire him. Surgery was his life, and he spent his holidays in visiting other clinics to learn what was best in other countries.

In the first world war he served as a major in the R.A.M.C. in France, and for a time acted as consulting surgeon to the Fourth Army. While on active service he made many friends among surgeons from Australia and New Zealand, and his name in those two countries in particular stood for all that was highest in surgery. Between the two wars Gordon-Taylor increased his reputation by his ceaseless surgical achievement. His clinic at the Middlesex drew people from all over the world. He kept up his interest in pure anatomy by examining for the primary F.R.C.S. examination for a great many years, and he journeyed to Australia to examine in the same subject. The Gordon-Taylor prize, which is awarded on the results of the Australian primary examination, permanently links his name with the Royal Australasian College of Surgeons, of which he was an honorary Fellow.

When war broke out in 1939 at first he worked with the Emergency Medical Service, but with his restless spirit he could not long remain doing routine work. He volunteered for the R.A.M.C. but was told he was too old, so he went across the road and asked to be taken in the Navy. Entering the senior service in the rank of surgeon lieutenant, he was very shortly afterwards gazetted surgeon rear-admiral, and in that capacity he did excellent work, travelling to Australia in the course of his duties. He remained consultant surgeon to the Navy after the war.

One of the most active parts of Gordon-Taylor's life began when he started to lessen his operative work. He had been elected to the council of the Royal College of Surgeons in 1932 and came out top of the poll at his re-election in 1940. He served as Vice-President of the College in 1941–3. He was in constant request to give special addresses and to serve almost as a surgical ambassador in different parts of the world. In 1938 he gave the Balfour lecture at Toronto, in 1940 the first Moynihan lecture at Leeds, and in 1943 he went for the British Council to Russia, and on that visit, on behalf of the Royal College of Surgeons, he conferred the Honorary Fellowship of the College on the famous Russian surgeons Judin and Burdenko. He served as temporary professor of surgery at Peter Bent-Brigham Hospital, Boston, in 1941 and 1946, and at the University of Cairo in 1947; and after his retirement in 1949 he took charge for some months of the surgical professorial unit at his old Alma Mater, the Middlesex.

Though modest and retiring, he had honours thrust upon him. He was made president of the Medical Society of London in 1941–2—being elected an honorary fellow in 1957; of the Royal Society of Medicine from 1944 to 1946—being the recipient of the Society's gold medal in 1956; and of the Association of Surgeons of Great Britain and Ireland in 1944–5. Other special lectures which he gave were the Syme oration at the Royal Australasian College of Surgeons, the Bradshaw and Thomas Vicary lectures (on two occasions) at the Royal College of Surgeons, the Lettsomian lectures at the Medical Society of London, the founder's day oration at Robert Gordon's College, Aberdeen, the Harveian lecture to the Harveian Society, the Hunterian oration to the Hunterian Society, the Rutherford Morison lecture at Newcastle, the Sir John Fraser memorial lecture at Edinburgh, the Cavendish lecture at the West London

Medico-Chirurgical Society, the Mitchell Banks memorial lecture at Liverpool, and the Sheen memorial lecture at the University of Wales. One of the finest orations he ever gave was during the celebrations attending the Royal Army Medical Corps' diamond jubilee in 1958. Speaking in the Great Hall of B.M.A. House without a note, he deeply impressed the large audience with the nobility and sincerity of his words. Many of his addresses were published in this journal, to which he also contributed countless appreciations of surgeons he had known all over the world when news of their death reached London.

Gordon-Taylor was a brilliant surgeon whose results were outstanding because of his scrupulous technique and expert skill. If proof were needed one need only recall that he performed more "hindquarter" amputations than any other surgeon had ever performed, and his mortality for this formidable operation was very low. His series of papers on this operation in the *British Journal of Surgery* are classics. His monograph on the "Dramatic in Surgery" showed his enterprise in undertaking very difficult cases, and at the age of 72 he was writing on the surgery of the innominate artery. As short a time ago as February last year, he published a masterly survey of the results of operation for various forms of cancer in the *British Medical Journal*. He trained a school of expert surgeons who gained staff appointments at many hospitals, and he was proud to see them attain celebrity.

Distinctions, academic and otherwise, came to him in profusion. Appointed O.B.E. in 1919, C.B. in 1942, he was knighted in 1946. An honorary D.Sc. of Cambridge, M.D. of Athens, LL.D. of Toronto and Melbourne, he was elected to the honorary fellowships of the Royal Colleges of Surgeons of Edinburgh, of Ireland, and of Canada, and of the Royal Australasian College of Surgeons. His distinction was recognized by other societies and academic bodies all over the world. Elected a trustee of the Hunterian Collection of the Royal College of Surgeons in 1955, he was honoured by the publication of a special birthday number of the *British Journal of Surgery* on his eightieth birthday.

Gordon-Taylor never missed an opportunity of meeting young surgeons from overseas, and he was unfailing in his attendance at the receptions given in B.M.A. House by the Commonwealth Medical Advisory Bureau. For years, too, he was a tower of strength to the Medical Panel of the British Council, taking an active part in planning overseas tours for distinguished British surgeons, and in helping the Council to entertain visiting teams of surgeons to Britain. He was one of the friendliest and most unassuming of men who would take enormous pains to give a helping hand where it was most needed. For him surgery and surgeons were the centre of his existence and the subject of endless interest and significance. If ever there was a dedicated man it was Gordon-Taylor.

His alert figure, with a bright carnation in his buttonhole, was a familiar and welcome presence at any medical gathering. He was one of the few real orators in the profession, and he would take endless pains in preparing an after-dinner speech. He was a generous and delightful host, and nothing pleased him more than to entertain friends and visitors from abroad at the Ritz Hotel, and in choosing the menu he would manage in it to pay a graceful compliment to his principal guest. A whole host of medical men and women all over the world will mourn his passing.

Sir Gordon Gordon-Taylor had been a widower since 1949.

L. C. R. writes: Few surgeons can have been more widely known or regarded with such affection as Sir Gordon Gordon-Taylor. "G. T." as he was known to his friends and as he liked them to call him, was not only the doyen of British surgery but was that rarity among surgeons, a classical scholar who sustained his interests in the classics, being a member of the Classical Association and president of the Horatian Society. I well remember seeing him reading Horace when travelling in an aircraft with him during the war.

His surgery was only major surgery: he had performed over 100 inter-ilio-abdominal amputations—more than had been performed by any surgeon anywhere—and he travelled all over the country to see possible cases for surgeons and carry out this formidable operation if he found it indicated. The results he obtained in radical breast surgery set a high standard which young surgeons have long tried to emulate. His pen was handled as deftly as his scalpel, and he also possessed the magic of the spoken word so that he was ever in demand for lectures, addresses, and written articles. Friendliness and kindliness were outstanding in his cheerful personality, and he had a superb memory, so that he never forgot friends. Many of these were in various parts of the Commonwealth, and he kept in touch each Christmas by sending well over 500 Christmas cards which he had personally endorsed to the countries in which they lived. He loved Australia, which he visited on a number of occasions, and was loved, admired, and respected there. His portrait has recently been painted for the Royal Australasian College of Surgeons.

Perhaps he was happiest when he was in a group of his friends. He was a great raconteur and gave us delightful accounts of intimate surgical history, recalling unusual experiences and the whims and foibles of past members of the profession whom he had known. He delighted in eponyms, because they recalled the high priests of the past, and regarded tradition, to use his own words, as "an imperishable heritage, to be an inspiration for service, God's greatest gift to mankind." As we take leave of him with affection we may well apply to him one of his own favourite quotations from the Roman poet Horatius Flaccus, *Integer vitae scelerisque purus*—a fine epitaph for a fine gentleman and a great and much loved surgeon.

"I wept as I remembered how often you and I
Had tired the sun with talking and sent him down the sky."

Sir ALAN ROOK, K.B.E., C.B., M.R.C.S., F.R.C.P. D.P.H.

Air Vice-Marshal Sir Alan Rook, formerly consultant in medicine to the Royal Air Force and senior health officer at the University of Cambridge, died at the Royal Air Force Hospital, Ely, on August 26. He was 68 years of age.

Alan Filmer Rook was born on January 16, 1892, at Forest Hill. Educated at Mill Hill School and Guy's Hospital, he qualified in 1915, and after working as resident obstetrician at his teaching hospital he joined the R.A.M.C. Transferring to the R.A.F. in 1918, he was permanently commissioned in that service two years later. Before that he had returned to Guy's for postgraduate study, and he took the M.R.C.P. in 1919 and the D.P.H. of Cambridge in the same year. The early part of his service was in the Middle East, where he assisted Wing-Commander H. E. (now Sir Harold) Whittingham in the investigation of sandfly fever. After working for a time in Palestine, he became Deputy Principal Medical Officer (Hygiene) in Iraq. In 1936 he was appointed consultant in medicine at the Central Medical Establishment, and in 1939 he was elected F.R.C.P. He was promoted group-captain in 1938, air-commodore in 1942, acting air vice-marshal in 1944, and air vice-marshal in 1946. Appointed O.B.E. in 1937, King's Honorary Physician in 1944, C.B. in 1946, he was knighted in 1948.

[*Elliott and Fry*

He became senior health officer at the University of Cambridge when he retired from the R.A.F. in 1948, and remained in that post until 1958. From 1951 to 1953 he was a member of the Central Council of the British Medical Association, serving also on the Armed Forces Committee and the Waverley Evidence Committee.

We are indebted to Air Marshal Sir HAROLD WHITTINGHAM for the following appreciation: With the passing of Air Vice-Marshal Sir Alan Rook, the Royal Air Force Medical Service has lost one of its most outstanding officers. He died after a long illness which he bore with great fortitude. For the first four years of his R.A.F. career Rook was employed as a squadron medical officer and thus obtained a sound knowledge and insight of aircrew and their life. In 1922 he was selected for pathology duties, and spent the next ten years as a clinical pathologist at home and abroad in the Middle East. He was a member of the R.A.F. Sandfly Fever Commission in Malta, and he made notable contributions to the elucidation of the life history of the sandfly and to preventive measures against this insect, which was causing a considerable amount of sickness among Service personnel overseas. His manual dexterity, enhanced by previous work in dentistry, was a great asset to his general laboratory skill, particularly in the construction of apparatus for his research studies. Throughout these years he combined pathology with clinical medicine, spending much time in the wards. In 1932 he forsook pathology and became physician to the R.A.F. Hospital at Halton, and in 1936 was appointed Consultant in Medicine to the R.A.F. In this new post he built up a high reputation as a physician as a result of his clinical acumen, integrity, and knowledge, as well as from the excellent training he gave to his juniors. His publications and reports were classics of great value to aviation medicine in general. Rook's ability, charm, devotion, and loyalty endeared him to his colleagues, staff, and patients. His election to the Fellowship of the Royal College of Physicians set the hallmark on his excellent work: he was the first R.A.F. medical officer to receive this distinction.

In addition to Rook's ability and success as a pathologist and physician he was a good musician and athlete. He excelled at all ball games, especially as a cricketer. He was versatile at the piano, had a good singing voice, and played his own accompaniments. He was shy by nature, and few but his intimate friends knew of his musical attributes. His death will be deeply felt by all those who were privileged to know him, and particularly by his colleagues in the R.A.F. Our deep sympathy is extended to his widow and son.

Dr. JAMES A. HISLOP writes: When the University Health Service was inaugurated at Cambridge in 1948, Sir Alan Rook was appointed senior health service officer. His long experience in the Royal Air Force in looking after the health and welfare of young men made him the ideal man to deal with the health problems of the undergraduates of Cambridge University. He had a profound interest in his work, and a kindly concern for individuals, which resulted in his becoming a friend and guide to many.

After working in cramped quarters in the wartime naval hut in the grounds of Downing College, the department of human ecology and university health service moved in 1951 to new buildings on Fenner's. There the consulting-rooms, x-ray department, laboratory, and the gymnasia allowed full scope for Rook's talent in developing the new service. He was very interested in tuberculosis and was a vice-president of the British Student Tuberculosis Foundation, which helps undergraduates to carry on with their studies while undergoing institutional treatment. He also appreciated the importance of mental health, and this was a part of the work of the university health service which he was at pains to see developed.

During the ten years of his tenure of office he was responsible for the collection of a vast amount of data relating to health matters, to academic progress, and to the sporting activities in the university, and this material is still being analysed. He examined the effects of sporting activities on longevity and reported his findings in this journal, and he also wrote on suicide among university students.

The benefit of Sir Alan's experience of service overseas was readily available to members of scientific expeditions and smaller parties of undergraduates who were going abroad during vacations. He gave them advice on preventive medicine and first aid, and saw that they had the appropriate medical stores packed to take with them. He was particularly interested in cricket, and it was his joy during the lunch hour to watch the game from the open windows of the department library, which overlook Fenner's.

When he retired barely two years ago Sir Alan took with him the affection of all the members of the department, and their best wishes for a happy retirement. To-day they mourn with the rest of his host of friends, and their thoughts turn to Lady Rook, and to his son Dr. Lionel Alan Rook.

PETER MACDONALD, M.D.

Dr. Peter Macdonald, a Vice-President of the British Medical Association and a former Chairman of the Representative Body, died at his home in York on August 28, at the age of 90. He will long be remembered for his medico-political activities, but probably his distinguished chairmanship of the Services Committee—undertaken during the second world war at an age at which most men feel justified in retiring from public life—will be reckoned his major achievement.

Peter Macdonald was born at Oban on April 16, 1870, the son of a minister. At the University of Aberdeen he was an outstanding student, graduating M.A. (with honours) in 1890, M.B., C.M. (with honours in medicine) in 1894, and proceeding M.D. in 1907. He won the John Murray medal and scholarship and the Matthews Duncan medal in obstetrics. After holding the posts of dispensary surgeon at Bradford Infirmary and house-surgeon at York Dispensary, he settled in practice in York, spending the whole of his professional life there, respected and admired by his medical colleagues and by a large body of citizens. In 1904 he became medical officer to Rowntree and Co. Ltd., one of the first concerns in the country to establish a medical service for its workers.

[York Press Photo Agency

Dr. Macdonald gained wide experience in his two specialties—ophthalmology and otolaryngology. For many years he was surgeon to the corresponding departments of York County Hospital, and also consulting aural surgeon to the St. John Institute for the Deaf and Dumb at York and consulting surgeon to the York School for the Blind. In the first world war he served as eye specialist in Northern Command with a temporary commission in the R.A.M.C. He was a member and past-president of the North of England Ophthalmological Society, a diligent attendant at gatherings of those practising the specialties in which he was interested, and the author of many papers on those subjects, including one in this journal written in conjunction with Bishop Harman on detachment of retina from looking at an eclipse of the sun.

It is many years since Dr. Peter Macdonald began to make his influence felt in medical politics. He mellowed greatly as time went on, but in the stormy days when medical service under the Insurance Act was being

hammered out, both hammer and anvil being new to the job, his alertness and incisive speech were generally enlisted in opposition to the powers that were. At the early Panel Conference he was one of the rebels and dissembled his love for the British Medical Association by very politely endeavouring to hasten its passage down the stairs. The chosen representatives of insurance practitioners were suspicious at that time, as they have often been since, of a raw deal from the Government. A new service was being shaped the liabilities of which were not clearly foreseen. Macdonald was critical of the organization of insurance practitioners as too unwieldy for wise decisions. He thought that the profession should be reorganized on a sectional basis.

In national politics—though here again he mellowed—he was, to begin with, an ardent Socialist, a member of the Independent Labour Party from 1898, and a friend and admirer of Keir Hardie. His personal appearance suggested the university don rather than the trade union leader, but in those far-off days he used to urge with fervour the adoption of trade unionism by the medical profession, and in answer to the argument that this would mean a split he said that he would rather have division than apathy.

At the Cambridge Meeting of the British Medical Association in 1920 he voiced in the Section of Medical Sociology his enthusiastic sympathy with the assumption of responsibility by the State for the medical services of the community, though he laid down certain conditions, one of which was that the medical profession should have, not indeed the whole, but the utmost possible control of the service. In 1921 he was speaking of the "fetish" of voluntaryism. In 1923 in his first speech at a Representative Meeting he declared that the voluntary system was played out.

Macdonald stood as Labour candidate for the Combined Scottish Universities in 1918, and his poll equalled half that of the successful Coalition candidates. He never sought parliamentary honours again. A few years later, however, though he never regretted his early enthusiasms, he declared publicly that, having failed to get practitioners in general to accept his views and those of his friends, he was not going to waste his time kicking against a wall. The Insurance Acts Committee—which was the storm centre in those days—had been appointed deliberately, he said, to represent panel committees, and that being so he accepted it and was ready loyally to do what he could to strengthen its hands.

Even better than the speech was its epilogue in the shape of more than two decades of service on behalf of the British Medical Association. He became a member of its Council in 1928, and for many years was chairman of the Hospitals Committee. The hospital policy of the Association has been under debate for many years. No sooner was it settled and embodied in a report than fresh amendments were found to be necessary and another revision had to be undertaken. In all this work Macdonald took the heaviest burden, showing himself extremely knowledgeable about hospital affairs, resourceful in suggestion, effective in conference and compromise with other bodies, and tireless in addressing meetings of one kind or another concerned with hospitals in any part of the kingdom. As a chairman he was extraordinarily patient and even over-indulgent.

Gradually he came into greater prominence in Association affairs until his election as Deputy Chairman of the Representative Body in 1939, and Chairman in 1942. As Chairman he presided over the Annual Representative Meetings of 1943, 1944, and 1945, and three Special Representative Meetings. The period was a difficult one, partly on account of the war and partly owing to the ferment already showing itself in expectation of a National Health Service. He acquitted himself in the chair with dignity and fairness and earned good will on all sides. Later his election as a Vice-President of the Association in 1948 was unanimously acclaimed. The rebel of 25 years earlier was now the elder statesman, and the voice once so assertive was now concerned with reconciling divergent points of view and giving prudent counsel. Politically he came to deplore nationalization, regarding it as a trend towards totalitarianism.

In addition to the Hospitals Committee, he served for many years on the Insurance Acts, Special Practice, and Public Health Committees, and on several special committees concerned with such subjects as medical education. He was also a useful member of the standing joint committee of the B.M.A. and the Trades Union Congress. He took a leading part in the organization of ophthalmic practitioners in the National Eye Service and of the National Ophthalmic Treatment Board. With all these central activities he managed to carry out a great deal of work for the profession in his own locality, where he had been chairman of the York insurance committee and President of the Yorkshire Branch of the Association. Towards the end of the second world war he became chairman of the Services Committee, having previously been deputy chairman. This was the committee which carried out practically all the detailed work of the Central Medical War Committee, being concerned with recruitment of doctors to the Armed Forces and associated matters.

Dr. Macdonald retired from public and professional life in 1951. His wife, the eldest daughter of Mr. Joseph Rowntree, died three months ago. He leaves three sons and a daughter.

Macdonald was a reticent man. He was a keen golfer, and for many years kept up his enthusiasm for boxing. Urbane and debonair, he was for many years a familiar figure at B.M.A. House.

Vital Statistics

Infectious Diseases

Areas where numbers of notifications were high in the latest two weeks for which figures are available.

	Week Ending Aug. 20	Week Ending Aug. 27
Dysentery		
Lancashire	60	**60**
Liverpool C.B.	14	**18**
Yorkshire West Riding	58	**43**
Leeds C.B.	36	**18**
Todmorden M.B.	4	**12**
Glasgow	108	**103**
Measles		
Lancashire	520	**428**
Liverpool C.B.	128	**119**
Manchester C.B.	74	**85**
Acute Poliomyelitis		
Devon	1	**5**
Plymouth C.B.	1	**2**
Barnstaple R.D.	0	**2**
Warwick	2	**4**
Birmingham C.B.	2	**4**
Food Poisoning		
Devon	28	**15**
Torquay M.B.	23	**12**
Norfolk	17	**16**
Norwich C.B.	14	**15**
Lancashire	40	**30**
Liverpool C.B.	15	**18**

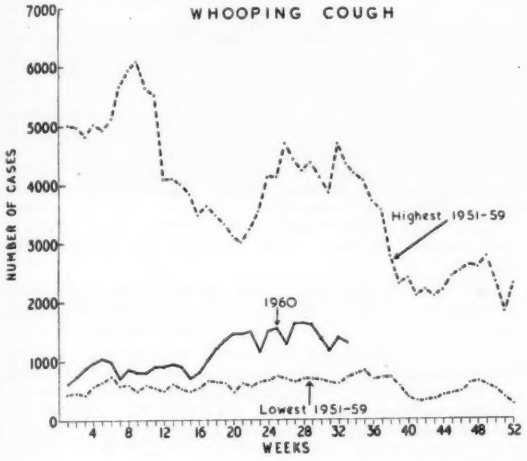
Accidents in Mines and Quarries

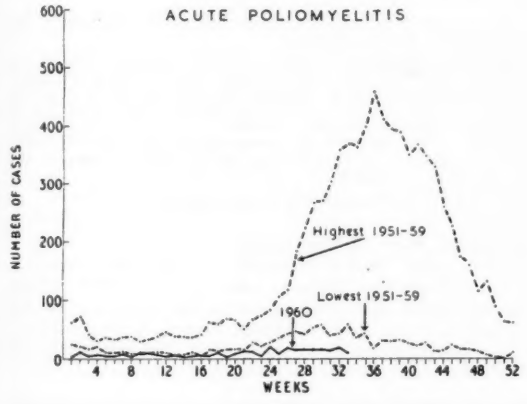
The number of men killed in accidents in coal mines in 1959 was 348, compared with 327 in 1958. The 1959 figure included 47 men killed in a fire at Auchengeich Colliery, Lanarkshire. The number of men seriously injured in mines in 1959 was 1,676. The trend to lower accident rates continues, but it is now appreciably slower than in the 1940's and early 1950's. In quarries, 30 persons were killed and 94 seriously injured during 1959, compared with 41 and 116,

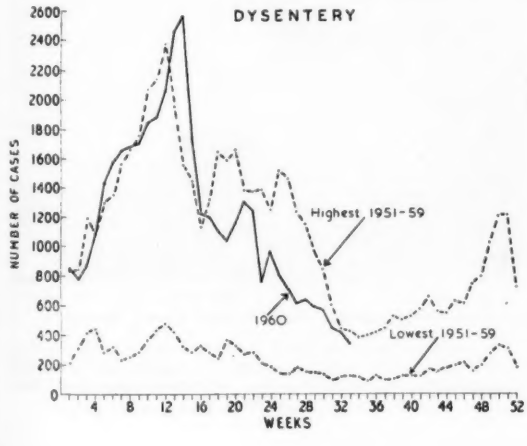
respectively, in 1958.—*Report of H.M. Chief Inspector of Mines and Quarries for 1959*, H.M.S.O., London, price 4s. net.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the years 1951–9 are shown thus ------, the figures for 1960 thus ————. Except for the curves showing notifications in 1960, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.







INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending **August 20** (No. 33) and corresponding week 1959.

Figures of *cases* are for the countries shown and London administrative county. Figures of *deaths* and *births* are for the whole of England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available.

The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES	1960					1959				
	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire
Diphtheria	1	0	0	0		0	0	0	0	2
Dysentery	346	38	153	12	7	385	47	179	8	6
Encephalitis, acute	5	0	0	0		2	0		0	
Enteric fever:										
Typhoid	2	0	0	0		8	3	0	23	2
Paratyphoid	5	2	0	0		17	1	1(B)	0	1(B)
Food-poisoning	247	31	23	3		250	31	13	1	
Infective enteritis or diarrhoea under 2 years				17	23				20	48
Measles*	2,057	114	43	2	2	2,778	90	25	19	55
Meningococcal infection	23	0	17	1		16	1	9	3	1
Ophthalmia neonatorum	22	4	4	0		31	6	6	0	
Pneumonia†	139	7	70	1		115	4	94	1	
Poliomyelitis, acute:										
Paralytic	3	1	1	} 0	8	34	11	1	} 0	2
Non-paralytic	7	2	2			24	4	2		
Puerperal fever§	167	27	8	1		214	39	7	0	
Scarlet fever	207	14	24	12	12	327	29	42	10	10
Tuberculosis:										
Respiratory	358	47	59	15		423	50	73	13	
Non-respiratory	53	6	9	7		53	2	13	3	
Whooping-cough	1,308	87	117	5	16	777	29	105	14	52

DEATHS	1960					1959				
	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire
Diphtheria	0	0	0	0	0	0	0	0	0	0
Dysentery	0	0		0		0	0		0	
Encephalitis, acute		0			0		0			0
Enteric fever	0	0	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years	4	0	2	0	0	3	0	1	0	0
Influenza	3	0	0	0	0	1	0	0		0
Measles		0	0	0	0		0	0	0	0
Meningococcal infection		0	0				0	0		
Pneumonia	378	30	13	9	5	367	30	17	8	1
Poliomyelitis, acute	1	0		0	1	1	0		0	0
Scarlet fever		0	0	0	0		0	0	0	0
Tuberculosis:										
Respiratory	} 60	4	1	1	2	} 62	5	7	2	1
Non-respiratory		1	0	0	0		1	2	1	0
Whooping-cough	1	0	0	0	0	0	0	0	0	0
Deaths 0–1 year	278	37	20	2	8	255	16	28	10	10
Deaths (excluding stillbirths)	8,622	644	485	96	132	8,168	601	507	108	107
LIVE BIRTHS	15,129	1310	969	287	404	41,136	1205	950	269	367
STILLBIRTHS	283	25	17			286	13	15		

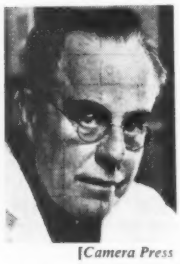
* Measles not notifiable in Scotland, whence returns are approximate.
† Includes primary and influenzal pneumonia.
§ Includes puerperal pyrexia.

Medical News

British Association's New President

Sir WILFRID LE GROS CLARK, F.R.S., has been elected president of the British Association for the Advancement of Science for the year 1961.

Sir Wilfrid, who last year celebrated his silver jubilee as Dr. Lee's professor of anatomy at Oxford University, was educated at Blundell's School, Tiverton, and St. Thomas's Hospital. He was a captain in the R.A.M.C. from 1916 to 1918, and returned to St. Thomas's as a demonstrator in anatomy in 1919, before going for three years to Sarawak as a principal medical officer. He returned to England as reader in anatomy at St. Bartholomew's Hospital Medical School from 1924 to 1927, and was professor there from 1927 to 1929, and at St. Thomas's from 1929 to 1934. He has wide interests in the anatomical field, ranging from comparative anatomy and neuro-anatomy to physical anthropology and palaeo-anthropology. In addition to his chair at Oxford he is honorary director of the Medical Research Council's Unit on Climate and Working Efficiency. His publications include *The Tissues of the Body* and *The Antecedents of Man*.



[*Camera Press*

New W.H.O. Public Health Appointment

Professor F. GRUNDY, Mansel Talbot professor of preventive medicine in the Welsh National School of Medicine, Cardiff, has been appointed an assistant director-general—there are four—of the World Health Organization. He will be responsible for the divisions of public health services, health protection and promotion, and education and training.

Professor Grundy graduated M.B., Ch.B. from Leeds University in 1927 and proceeded M.D. in 1933. He took the D.P.H. in 1931, and obtained his M.R.C.P.(Lond.) in 1951. He is a barrister-at-law of the Inner Temple. After five years of hospital appointments he entered the public health service, becoming medical officer of health, Luton, Bedfordshire, in 1937, where he stayed until he took up his present post in 1949. His appointments include the vice-presidency of the Royal College of Midwives, and his previous work with W.H.O. has covered a study of undergraduate education in hygiene and preventive and social medicine in 19 European countries, a consultancy to the expert committee on postgraduate training in the public health aspects of nuclear energy, and a short-term consultancy to advise the Government of Ceylon on the consolidation of the island's public health law. He has published books and articles on public health subjects and his researches have been mainly in the fields of epidemiology and social medicine.

Colonial Development and Welfare

Provisional figures for the last financial year show that a record sum of £25½m. was provided for development and welfare schemes in British overseas territories.

Schemes for developing water supplies and sanitation received grants totalling £2,993,512, and medical and health services benefited to the extent of £2,564,655. Of grants approved for research work totalling £2,370,261, £1,009,974 went to agricultural research, £560,600 to work on pesticides and £375,080 to medical research. Grants approved for Uganda included £1,229,062 for the new hospital at Mulago, and for Nigeria £341,500 for the development of health services. (House of Commons Paper, No. 244, H.M.S.O., price 2s. 6d.)

Annual Report of Jerusalem Ophthalmic Hospital

The *Report of the Committee for 1959* of the Ophthalmic Hospital of the Order of St. John, Jerusalem, says that 164,155 patients have been seen during the year, while 3,500 major operations have been performed—an increase of 376 on last year's figure, which was itself a record. The most common operations—with the number performed in 1955 given in brackets—were: lids and adnexa—tarsectomy, 945 (0); lens—senile cataract, 751 (283); conjunctiva—pterygium, 615 (259). Cataract cases, says the report, continue to increase in almost arithmetical progression. The summer was cool, which may account for the absence of the usual violent epidemic of conjunctivitis and explain the slight fall in the total number of new cases—30,538 as against 32,278 in 1958.

Additions to B.M.A. Film Library

Copies of the following films have been presented to the film library by Aspro-Nicholas, Ltd., Ciba Laboratories, Ltd., Dalmas, Ltd., Glaxo Laboratories, Ltd., Johnson and Johnson (Great Britain), Ltd., and T. J. Smith and Nephew, Ltd.:

Atheroma—A New Therapeutic Approach. 16 mm. colour, sound, 28 min. 1960. Suitable for undergraduate, postgraduate, specialist, and consultant audiences. *Tendon Free Grafting Demonstrated on a Case of Leprosy with Intrinsic Paralysis of the Hand*. 16 mm. colour, sound, 17 min. 1959. Suitable for postgraduate, specialist, and consultant audiences. *Ambulant Treatment of Leg Ulcers*. 16 mm. colour, mu., 20 min. 1959. Suitable for undergraduate, postgraduate, specialist, and consultant audiences. *Upper Lobectomy with Sleeve Resection of the Main Bronchus*. 16 mm. colour, sound, 25 min. 1959. Suitable for postgraduate, specialist, and consultant audiences. *The Griseofulvin Story*. 16 mm. colour, sound, 20 min. 1960.* *Hospital Sepsis: a Communicable Disease*. 16 mm. colour, sound, 30 min. 1959. U.S.A.* *The Thomas Splint*. 16 mm. colour, sound, 24 min. 1959. Suitable for undergraduate audiences.

The following films have been placed in the film library on extended loan from Pfizer, Ltd., and the Shell Petroleum Company, Ltd.:

Bronchial Carcinoma. 16 mm. colour, sound, 1959. Suitable for undergraduate and postgraduate audiences. *The Sully Concept of Complicated Primary Pulmonary Tuberculosis*. 16 mm. colour, sound, 45 min. 1959. Suitable for postgraduate, specialist, and consultant audiences. *Unseen Enemies*. 16 mm. colour, sound, 32 min. 1959.* *Malaria*. 16 mm. B./W., sound, 15 min. 195–.*

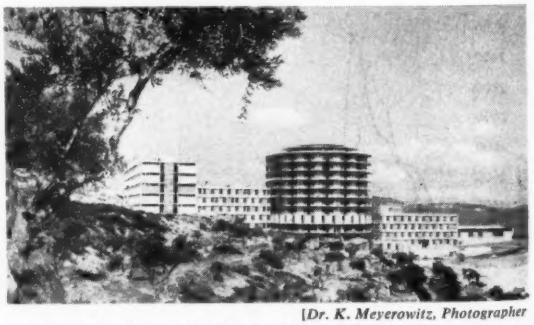
Copies of the following films have been purchased for inclusion in the film library:

Marlborough House. (The training of mentally handicapped children and adults at a day training centre.) 16 mm. colour, sound, 12 min. 1958.* *Correction of Uniocular Aphakia by Anterior Chamber Acrylic Implants*. 16 mm. colour, silent, 22 min. 1958. Suitable for postgraduate, specialist, and consultant audiences. *A Talk With Sir Henry Dale*. 16 mm. B./W., sound, 16 mm. 1960.*

(*Suitable for general showing.)

Jerusalem's New Medical Centre

The partly finished buildings of the new Hadassah-Hebrew University Medical Centre were dedicated recently in the Judean hills west of Jerusalem. The Centre will replace a similar unit at Mount Scopus to the north-east of Jerusalem, which was established in 1936 and abandoned after the Palestine war of 1948.



[*Dr. K. Meyerowitz, Photographer*

Hadassah-Hebrew University Medical Centre, Jerusalem.

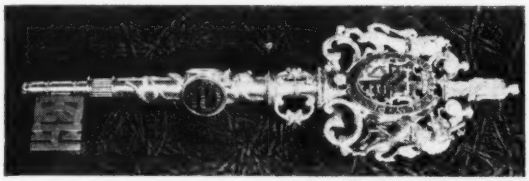
The Hadassah organization of the United States is contributing $22,000,000 to the hospital, while the university is raising $7,400,000 for the medical school. (The buildings have been designed by J. M. NEUFELD, of New York.)

B.M.A. Film Competition, 1960

The closing date for receipt of entry forms is September 30, and of films November 15. Further details may be obtained from the Secretary, B.M.A. House, Tavistock Square, London W.C.1.

Birmingham Hospital's Ceremonial Key

The eight-inch long, 18-carat gold key with which Queen Victoria's daughter, Princess Christian, opened Birmingham's General Hospital in Steelhouse Lane on July 7, 1897, has been bought for £225 by a Birmingham industrialist. He has not yet decided whether to give it to the city or to the General Hospital. The key was put up for auction by a person who wished to remain anonymous. (*Birmingham Post*, August 27, September 1.)



[Birmingham Post and Mail

The ceremonial key.

Clean Air Council

Dr. C. A. BENCE and Dr. LLYWELYN ROBERTS are among those appointed to the Clean Air Council.

People in the News

Colonel ELSTON GREY-TURNER, M.C., T.D., R.A.M.C., T.A., an Under Secretary of the B.M.A., has been appointed an honorary physician to the Queen.

Dr. J. R. REES, director of the World Federation for Mental Health, has been given the Lester Award and the Samuel Rubin Award in the United States for his achievements in the field of mental health.

A party of British neurologists, headed by Dr. H. GARLAND as ex-president of the neurological section of the Royal Society of Medicine, are to visit Bucharest and other Rumanian neurological centres at the invitation of the Academy of Medical Sciences of the Rumanian People's Republic.

COMING EVENTS

Nutrition Society (Scottish Group).—Symposium: "Food Habits in Britain," September 24, 1.45 p.m., Institute of Physiology, The University, Glasgow W.2. Details from Dr. J. DAVIDSON, Rowett Research Institute, Bucksburn, Aberdeen.

London School of Hygiene and Tropical Medicine.—Occupational health course for general practitioners and industrial medical officers, September 26–October 1. Details on advertisement p. 75.

King's College Hospital Medical School.—Inaugural address: the Rt. Hon. Lord TWINING, September 30, 2.30 p.m., the Medical School, Denmark Hill, London, S.E.5.

Westminster Hospital Medical School.—Inaugural address: The Very Reverend E. S. ABBOTT, Dean of Westminster, October 3, 3 p.m., Church House, Great Smith Street, London S.W.1.

Leeds Neurological Sciences Colloquium.—Tuesdays, 5.15 p.m., from October 4 to December 20, Littlewood Hall, General Infirmary, Leeds. For programme see *Journal* Diary each week.

Yorkshire Glasgow Graduates Association.—Annual dinner, October 7, Hotel Metropole, Leeds. Guest of honour: Sir COMPTON MACKENZIE. Graduates who have come to live in Yorkshire are invited to write to Mr. JAMES WISHART, 33 Manor Row, Bradford 1.

Charing Cross Hospital Medical School.—Inaugural address: Lord PIERCY, October 13, 3 p.m., Beveridge Hall, Senate House, London W.C.1.

Bengué Memorial Award Lecture.—Dr. W. A. R. THOMSON: "Doctors, Drugs, and Diseases," October 19, 5 p.m., Lecture Hall, Royal Institute of Public Health and Hygiene, 28 Portland Place, London W.1. Admission free without ticket.

Harben Lectures.—Professor R. E. KEHOE (Kettering Laboratory, University of Cincinnati): "The Metabolism of Lead in Man in Health and Disease," October 25, 26, 27, at 5 p.m., Lecture Hall, Royal Institute of Public Health and Hygiene, 28 Portland Place, London W.1. Admission free without ticket.

Ministry of Health Courses.—Autumn courses for physical medicine and orthopaedic consultants and senior registrars, "Rehabilitation of the Amputee," will be held on November 2–3, and November 21–25, respectively, at the Limb-Fitting Centre, Queen Mary's Hospital, Roehampton, London, S.W.15. Applications to the Principal Medical Officer, Artificial Limbs and Appliances (Med. 5 PL), at that address.

NEW ISSUES

JOURNAL OF CLINICAL PATHOLOGY

Reticulo-endothelial Sarcoma Arising in the Nose and Palate (Granuloma Gangrenescens). E. W. Walton.
Chromoblastomycosis Simulating Rhinosporidiosis in a Patient from Ceylon. W. St. C. Symmers.
Polyarteritis Nodosa and Congenital Pyloric Hypertrophy in a 3-month-old Infant. T. R. Savage and J. F. Smith.
Thymolipoma: A Benign Tumour of the Thymus Gland. A. J. Shillitoe and J. E. Goodyear.
Polycythaemia Vera and Christmas Disease with Slightly Prolonged Prothrombin Time. J. A. S. Amos.
Effects of Posture on Plasma Volume and Some Blood Constituents. J. K. Fawcett and V. Wynn.
Multiple Congenital Coagulation Deficiencies. J. A. Bonnin, N. D. Hicks, M. D. Innis, and D. A. Simpson.
The Blood Groups of Gastric Ulcer-cancer. W. H. Beasley.
A Comparison of the Rose-Waaler, Latex Fixation, "RA-test," and Bentonite Flocculation Tests. C. L. Greenbury.
The Haemagglutination Test for Toxoplasma Antibodies. R. G. Mitchell and C. A. Green.
Penicillin Resistance in Staphylococci Isolated in a Casualty Department. David J. B. Ashley and M. J. Brindle.
The Specificity of the Sabin-Feldman Dye Test with Reference to Protozoal Infections. C. Kulasiri.
Gastric Proteolysis in Disease—4. W. H. Taylor.
N-Acetyl-β-glucosaminidase Activity in Serum During Pregnancy. P. G. Walker, Mary E. Woollen, and Doreen Pugh.
Determination of Magnesium by the Titan Yellow and Ammonium Phosphate Methods. F. W. Heaton.
Technical Methods.
Book Reviews.

Volume 13, No. 4. (Bi-monthly; £4 4s. annually.)

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Tuesday, September 13

ROYAL ARMY MEDICAL COLLEGE—5 p.m., Dr. Kenneth Perry: Carcinoma of the Lung.

Wednesday, September 14

CAMBRIDGE MEDICAL SOCIETY.—At Owen Webb House, 1 Gresham Road, Cambridge, 8.30 p.m., Dr. D. Russell-Davis: Road Accidents—Alcohol and Some Other Medical Problems.

Thursday, September 15

GROUP FOR REPRESENTATION OF THE VIEWS OF CLINICAL PSYCHIATRISTS.—At Ryzate Room, Tavistock House North (Fourth Floor), Tavistock Square, London W.C., 5.30 p.m., committee meeting.

Friday, September 16

INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Dr. J. G. Scadding: clinical demonstration.
SHEFFIELD UNIVERSITY.—At Department of Psychiatry, Whiteley Wood Clinic, 5.30 p.m., Dr. Karl Menninger (Topeka): Psychiatric Case Study.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Emslie-Smith.—On August 22, 1960, at Princess Louise Hospital, London W., to Judy (formerly Milne) and Donald Emslie-Smith, a son.

DEATHS

Beatty.—On July 12, 1960, Adam Alexander Beatty, M.D., of Toronto, Canada, aged 86.
Elvins.—On August 5, 1960, at 75, Scalby Road, Scarborough, Ralph Sedgley Elvins, L.R.C.P.&S.Ed., formerly of Tollerton, aged 86.
MacLean.—On July 17, 1960, at Dryburn Hospital, Durham, William Gordon MacLean, M.B., Ch.B., of Valdigarth, Wheatley Hill, Durham, aged 57.
Pearson.—On August 3, 1960, at 30, Half Moon Lane, Herne Hill, London, S.E., Thomas Pearson, M.R.C.S., L.R.C.P., D.O.M.S.
Rees.—On August 30, 1960, suddenly, Edward John Rees, M.R.C.S., L.R.C.P., of 4 Gelliwastad Road, Pontypridd, Glam, aged 62.
West.—On August 3, 1960, Glyn Austin Yeo West, L.R.C.P., L.R.C.S., of Corner House, Great Torrington, N. Devon.

Any Questions ?

We publish below a selection of those questions and answers which seem of general interest. It is regretted that it is not possible to supply answers to all questions submitted.

Corticosteroids and Hirsutism

Q.—*A correspondent*[1] *described growth of hair after a course of cortisone in a patient who had lost all his hair at the age of 4. Two papers, one on post-pubertal adrenal virilism*[2] *and the other on treatment of simple hirsutism,*[3] *suggested that some degree of improvement of hirsutism occurred with steroid treatment. It would appear that in the first case steroid treatment may have caused the growth of hair and in the others suppressed it. What is the explanation of this apparent contradiction?*

A.—A regrowth of hair after alopecia totalis is a not unfamiliar occurrence, and it cannot be concluded with certainty that the cortisone treatment given to the patient was helpful. If it was, then the explanation is not known.

The improvement in hirsutism due to adrenal hyperplasia, following treatment with corticosteroids, has a rational explanation. In adrenal virilism a defect of the hydroxylating mechanism in the adrenal cortex prevents the adequate production of cortisol (hydrocortisone), which alone of the adrenal steroids has an effective suppressing action on the secretion of adrenocorticotrophic hormone (A.C.T.H.) by the anterior pituitary gland. Because of the inadequate production of cortisol, A.C.T.H. is produced in excess, causing the adrenal hyperplasia and the overproduction of adrenal steroids, some of which are abnormal and the sum total of which have virilizing actions. Hirsutism is one of the results. When a corticosteroid such as cortisone or prednisone is administered, the oversecretion of A.C.T.H. ceases and output of adrenal steroids (of which the 17-ketosteroid excretion is a rough measure) falls. In consequence, the hirsutism may slowly decrease. Possibly a similar mechanism obtains in those cases of simple hirsutism which respond to corticosteroid therapy. However, the fact remains that most cases of simple hirsutism are unaffected by this treatment.

REFERENCES

1 Atkinson, E. C., *Brit. med. J.*, 1960, **1**, 729.
2 Brooks, R. V., Mattingly, D., Mills, I. H., and Prunty, F. T. G., ibid., 1960, **1**, 1294.
3 Mattingly, D., Mills, I. H., and Prunty, F. T. G., ibid., 1960, **1**, 1298.

Epileptics and Car-driving

Q.—*An apprentice engineer, aged 18, suffered from petit mal attacks three years ago. These were well controlled with medication and he has now had no attacks since September, 1958. He is anxious to know when he may return to work on machines. Also he inquires about the possibility of a driving licence. May I have your views on the general principles which should govern the answers to these questions in controlled epilepsy, both major and minor?*

A.—While still having medication for epilepsy, the patient can certainly not be issued with a driving licence. It is harder to decide whether he should work on machines. For in this case, were he to have a fit, he would endanger only himself and not others, as in the case of driving. If the patient is unwilling to consider taking up other work, if he himself is willing to take the risk of having a fit while working with machines, and if his employers know that he has had fits and that he has not had any since a certain date, and if they are willing to take the risk of him having a fit, he could be allowed to work with machines.

This matter of patients who have had fits being allowed to drive is a difficult one. Eighteen months ago the League Against Epilepsy spent an entire afternoon debating this question, and it did not come to any firm generally agreed conclusions. The following facts should not be lost sight of: the doctor does not know how many fits an epileptic patient is having. He relies entirely on what the patient tells him. If the patient chooses to deceive him, he usually has no way of finding this out. Doctors should therefore always remember this when giving certificates about epileptics. They can only say that the patient tells them that he has been free from fits for such a time. It is unfortunate that when this statement appears on a certificate it seems to imply that the doctor does not believe the patient; but that is not intended.

When a person signs the form of application for a driving licence he states that he does not and has never suffered from epilepsy or faints. If someone who has had fits answers this question honestly, he is likely to find that he will not be granted a licence. He can then appeal against this and seek the support of a neurologist's opinion. Essentially the neurologist can know only what the patient tells him about his fits. He can carry out an electroencephalogram, which may be quite normal even though the patient is suffering from fits, or may be abnormal when the patient is not having fits. I think many neurologists take the following way out of this dilemma: if the patient has been free from medication and without fits for three years, they recommend that he should be allowed to drive.

There are, however, some special cases. For example, some patients have only nocturnal attacks and have never had an attack while awake. Many neurologists would be willing to support an application to drive by a patient of this type; and this seems to be a reasonable decision.

Eating with Splinted Jaws

Q.—*What sort of diet may be given to a patient with a bilateral fracture of her mandible whose jaws are splinted together?*

A.—Patients with intermaxillary fixation for the treatment of fractures of the jaws can usually manage to eat an astonishingly large amount of semi-solid food—minces, purées, etc. The method of doing this is to place the food in the buccal portion of the vestibule and then push it round the back of the last molar tooth with the finger. This is messy, but effective. The diet can be supplemented by raw eggs beaten up in milk, and flavoured as required (brandy is often appreciated), and by "complan," a proprietary balanced diet product.

Fluorescent Lighting

Q.—*Is fluorescent lighting harmful to the eyes of workers or schoolchildren?*

A.—There is no evidence that fluorescent lighting is harmful.

Collected Articles from the "British Medical Journal"

The following books are available through booksellers or from the Publishing Manager, B.M.A. House. Prices, which include postage, are now the same for both inland and overseas.

Refresher Course for General Practitioners, Volume 3 (26s. 9d.).
Clinical Pathology in General Practice (22s. 3d.).
Any Questions?, Volume 3 (8s. 3d.).

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 4499. TELEGRAMS: *Aitiology, Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

Authors desiring REPRINTS should communicate with the Publishing Manager, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors overseas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

ADVERTISEMENTS should be addressed to the Advertisement Director, B.M.A. House, Tavistock Square, London, W.C.1 (hours 9 a.m. to 5 p.m.). TELEPHONE: EUSTON 4499. TELEGRAMS: *Britmedads, Westcent, London.*

MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association. TELEPHONE: EUSTON 4499. TELEGRAMS: *Medisecra, Westcent, London.*

B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.